STUDIES IN METHODS . . . SERIES F No. 7

Handbook of Vital Statistics Methods

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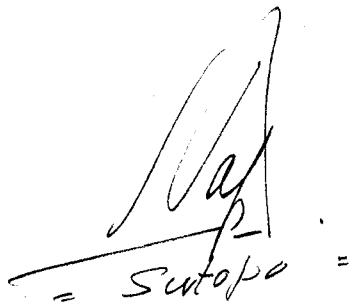

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Handbook of Vital Statistics Methods

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TABLE OF CONTENTS

		Page
Introduction		1
Chapter	I. Evolution and present status of vital records and statistics	3
	II. Uses of vital records and vital statistics in the modern world	12
	III. Governmental provision — legal and administrative — for registration of vital events and for compilation of vital statistics	19
	IV. Statistical definition of events to be registered and counted	46
	V. Registration — the registrar and the informant	64
	VI. The registration process	77
	VII. The register and the registration record	90
	VIII. The reporting process and the statistical report	101
	IX. Items on statistical reports of vital events	113
	X. Items on statistical reports: uses, definitions, classifications, and problems relating to	120
	XI. Compilation — statistical processing	150
	XII. Tabulation — principles and programme	164
	XIII. Computation of rates and indices	184
	XIV. Evaluation of the vital statistics system	200
Annex	1. Chronology of important events in the development of civil registration and vital statistics	213
	2. *Principles for a Vital Statistics System*	217
	3. Definition of stillbirth: 84 geographic areas, as of 1 January 1950	230
	4. Selected list of references	237
Index		253

LIST OF TABLES

Page

Table 1. Date of compulsory national civil registration law governing registration of live births, deaths, stillbirths, marriages, and divorces: 65 countries, as of 1 January 1950 20

2. Agency of government reported to be responsible for civil registration function at local and national levels and for compilation of national statistics on live births, deaths, stillbirths, marriages, and divorces: 65 countries, as of 1 January 1950 27

3. Criteria for registration as a live birth: 65 countries, as of 1 January 1950 48

4. Manner in which liveborn infants who died before registration of birth are registered and subsequently reported for statistical purposes: 65 countries, as of 1 January 1950 51

5. Definition of a stillbirth in terms of "viability" and of "signs of life": 65 countries, as of 1 January 1950 55

6. Number of primary registration units in relation to area and total population: 28 countries, as of 1 January 1950 66

7. Identity of informant for registration of live birth, death, stillbirth, marriage, and divorce; identity of notifier of live birth and death: 65 countries, as of 1 January 1950 71

8. Place where registration of live birth, death, stillbirth, marriage, and divorce must be made: 65 countries, as of 1 January 1950 78

9. Fee required for registration of live birth, death, stillbirth, marriage, and divorce: 65 countries, as of 1 January 1950 81

10. Time allowed for registration of live birth, death, stillbirth, marriage, and divorce: 65 countries, as of 1 January 1950 84

11. Type of record used for registering live births, deaths, stillbirths, marriages, and divorces in civil registers: 65 countries, as of 1 January 1950 90

12. Type of statistical report prepared by civil registrar and used for annual compilation of national statistics of live birth, death, stillbirth, marriage, and divorce: 65 countries, as of 1 January 1950 105

To be found in pocket at the end of the volume:

13. Items of statistical information included in statistical report of live birth: 61 countries, as of 1 January 1950

14. Items of statistical information included in statistical report of death: 61 countries, as of 1 January 1950

15. Items of statistical information included in statistical report of stillbirth: 61 countries, as of 1 January 1950

16. Items of statistical information included in statistical report of marriage: 61 countries, as of 1 January 1950

17. Items of statistical information included in statistical report of divorce: 61 countries, as of 1 January 1950

INTRODUCTION

Purpose and background of the Handbook

This *Handbook of Vital Statistics Methods* has been prepared in the Statistical Office of the United Nations to assist countries in the development and appraisal of their vital-statistics services. Its purpose is to explore current practices, to make conveniently available recommended statistical standards, and to present uniform concepts, definitions, and procedures upon which development of national vital statistics and the improvement of their international comparability may be based.

Recognition of the efficacy of this type of assistance to help governments provide the wide range of economic and statistical information required for developing modern socio-economic policies, led the General Assembly of the United Nations to recommend, in resolution 407 (V), the preparation of Guides for Organization and Collection of Economic Data in Underdeveloped Countries.[1]

Even before this action of the General Assembly, however, a programme of this type had been undertaken in the field of population censuses. At its fourth session, the Economic and Social Council had adopted a resolution (41 (IV), 29 March 1947) requesting the Secretary-General of the United Nations to offer advice and assistance to Member States with a view to improving the comparability and quality of data obtained at the censuses in 1950 and proximate years. As one means of implementing this resolution, information on methods used in the population censuses of different countries was assembled, analysed, and set forth in the *Handbook of Population Census Methods*[2] and in *Population Census Methods*.[3]

In the field of vital statistics, studies similar to those on census methods were undertaken by the Statistical Office of the United Nations in 1950. These studies were initiated in response to a resolution of the Statistical Commission at its fourth session,[4] which requested the Secretary-General "to study the different systems of vital registration in order to promote comparability of definitions, the adequacy and comparability of classification and tabulations, and the development generally of effective registration systems". Since recent information of this type was not generally available,[5] it was necessary to assemble official information on the vital-statistics system of each country. Accordingly, in January 1950 a request for a description of the process of registering live births, deaths, stillbirths, marriages, and divorces and of compiling vital statistics from data in these records, was sent to every country and non-self-governing area. Replies were received from over 100 areas, of which 65 were sovereign countries[6] and the remainder non-self-governing.

A provisional survey of the information assembled from the various countries came before the Statistical Commission for consideration at its fifth session and, as a consequence, the Commission recommended

> "that the Secretary-General
>
> "(*a*) Complete the studies already undertaken and incorporate pertinent findings in a Handbook of Vital Statistics Methods; and
>
> "(*b*) In co-operation with other appropriate international agencies and with the advice of technical experts prepare detailed draft recommendations for the improvement and standardization of vital statistics . . ."[7]

Method of analysis

In planning the study and its subsequent presentation in a *Handbook*, several methods of analysing the material were considered. Information for each country could be set forth according to a uniform outline, as was done in the *Official Vital Statistics of [Twenty-Two Countries]*[8] and in *Abstract of arrangements respecting registration of births, marriages and deaths in the United Kingdom and the other countries of the British Commonwealth of Nations, and in the Irish Republic;*[9] individual narrative descriptions could be produced for each country, which was the method employed for general statistical activities in *Statistical Activities of the American Nations, 1940;*[10] or a cross-section comparative analysis by subject matter could be undertaken.

[1] *Official Records of the General Assembly, 5th Session. Supplement No. 20* (A/1775), resolution 407 (V).

[2] *Handbook of Population Census Methods.* United Nations. Statistical Office. Document ST/STAT/SER.F/5, June 1954. 143 p. (Sales No. 1954.XVII.4)

[3] *Population Census Methods.* United Nations. Statistical Office and Department of Social Affairs, Population Division. Document ST/SOA/Series A, No. 4, November 1949. 197 p. (Sales No. 1949.XIII.4)

[4] *Official Records of the Economic and Social Council, 9th Session, Supplement No. 6* (E/1312-E/CN.3/82), para. 74.

[5] See chapter I, part D for review of previous activities in the field.

[6] For a complete list of countries for which returns were analysed, see the stub of table 1, p. 20.

[7] *Official Records of the Economic and Social Council, 11th Session, Supplement No. 4* (E/1696/Rev.1), para. 88 (*b*).

[8] *Statistical Handbooks Series.* League of Nations. Health Organisation. Nos. 1-14, Geneva, 1924-1930.

[9] *Abstract of arrangements respecting registration of births, marriages and deaths in the United Kingdom and other countries of the British Commonwealth of Nations, and in the Irish Republic.* U.K. General Register Office. London, H.M. Stat. Off., 1952. 204 p.

[10] *Statistical Activities of the American Nations, 1940;* a compendium of the statistical services and activities in 22 nations of the Western Hemisphere, together with information concerning statistical personnel in these nations. Inter American Statistical Institute. Washington, 1941. 842 p.

Since the purpose of the study was to delineate the basic elements of national vital-statistics systems, it was decided that data for the 65 sovereign political units should be analysed by the cross-section comparative method.

This *Handbook,* therefore, comprises a world-wide cross-section of actual (1950) practices, procedures, and methods, both administrative and statistical, rather than a theoretical description of the operations of a hypothetical vital-statistics system. The tabular analyses are international comparisons of the elements of the vital-statistics system. In addition to its convenience from a presentation viewpoint, this type of analysis has the additional advantage of making possible the derivation of certain recommendations for the registration of vital events and the compilation of vital statistics — recommendations which in this case have been published as the *Principles for a Vital Statistics System,*[11] described in chapter I, p. 11.

[11] *Principles for a Vital Statistics System; Recommendations for the Improvement and Standardization of Vital Statistics.* United Nations. Statistical Office. Document ST/STAT/SER. M/19, 26 August 1953. 28 p. (Sales No. 1953.XVII.8)

Scope of the Handbook

Practices and procedures discussed in this *Handbook* pertain primarily to those in use in connexion with records and statistics of live birth, death, stillbirth (late foetal death), marriage, and divorce, and not, except by inference, to those related to adoptions, recognitions, legitimations, annulments, or legal separations. For all practical purposes, the date of reference is the date of the initiation of the survey, i.e., 1 January 1950, and unless otherwise specified, the information in the tables refers to data related to that date, received from official sources.

The *Handbook* comprises 14 chapters and 4 annexes. Chapters I-III deal with the vital-statistics system in general, that is, with the history, uses, and general organization of the system. Chapters IV-VII describe the responsibilities for, and the procedures followed in, the registration of vital events. Chapters VIII-XIII have to do with the collection of data for vital statistics, the compilation and tabulation programme, and computation procedures. Chapter XIV presents methods of evaluating the efficiency of the vital-statistics system. Annex 1 is a chronological history of the development of vital statistics; Annex 2, the *Principles for a Vital Statistics System;* Annex 3, a collection of "stillbirth" definitions; and Annex 4, a selected list of references.

CHAPTER I

EVOLUTION AND PRESENT STATUS OF VITAL RECORDS AND STATISTICS

To place vital-statistics methods in their proper perspective, it is necessary first to have an understanding of the history of vital records and statistics. Knowledge of the origin of vital records, the various methods by which vital statistics may be obtained, the present status of vital-statistics systems, and the efforts of international organizations, past and present, to remedy deficiencies, provides the background against which current methods, procedures, and recommendations can be evaluated.

A. Definitions and history

Vital records may be defined as those concerned with live births, deaths, foetal deaths, (stillbirths), marriages, divorces, adoptions, legitimations, recognitions, annulments, and separations, in short all the events which have to do with an individual's entrance into or departure from life, together with the changes in civil status which may occur to him during his lifetime. It follows that vital statistics are those statistics which, for a designated population group, provide a description of the number and characteristics of the vital events which are taking place therein. These events are the "statistical units" with which this *Handbook* will be concerned.

Vital statistics have to do with people rather than with things and, consequently, this branch of statistics has perhaps the second oldest history in the world, surpassed in antiquity only by the closely related population enrolment or census. The population census or human inventory, which is the most fundamental and far-reaching statistical inquiry that can be undertaken, provides a picture of the population and its characteristics at one moment of time; vital statistics provide the tools for measuring the dynamics of, or the changes which continuously occur in, this instantaneous picture.

The fundamental character of the events with which vital statistics are concerned and their basic importance in the culture of a people are the reasons why the recording of births, deaths, marriages, and divorces has been an established procedure in all civilized nations for many years. However, the vital events which are now identified as the "units" of vital statistics were not always so recognized. A glance into the origins of the registration system and its transition from an ecclesiastical to a secular undertaking will show why this was so.

1. ORIGIN — ECCLESIASTICAL ROLLS

Except for fragmentary vital registration during the pre-Christian era, which in Egypt, Greece, and Rome for example appears to have been carried out by civil authorities for revenue or military purposes, the recording of vital events was originally the unco-ordinated concern of the individual ecclesiastical authorities. The "vital events" for which ecclesiastical authorities, then as now, had a responsibility were baptisms, burials, and weddings rather than births, deaths, and marriages. In the church of the Middle Ages, baptism of every child was compulsory; likewise, in order to receive the sanction of the church, burials and weddings also came within the purview of the clergy. The participation of the clergy in ceremonies associated with any of these three acts was usually rewarded by a payment of some sort, and the recording of these payments, or the lack thereof, produced a limited register of baptisms, burials, and weddings.

It is easy to see why registers so produced would be limited in coverage and quality. The fundamental deficiency, of course, stems from the fact that the ecclesiastical registers recorded payment for ceremonies rather than the occurrence of events. Secondly, such registers were restricted to religious rites among a specified denomination of one parish, and they were maintained solely at the discretion of the priest in charge. Because of this factor, they could not fail to be of limited coverage with respect to members of other religious faiths (non-conformists) as well as to be unsystematic and non-uniform from parish to parish. Finally, the records themselves were designed not to attest to civil or biological facts, but to record the payment of a fee for a service. Hence, they would tend to include those data deemed relevant, such as the date of the ceremony involved, rather than the date of the occurrence of the event in question, which was not considered pertinent. These defects in ecclesiastical rolls as registers of vital events persisted in spite of statutes and ordinances promulgated by the church authorities in an effort to make church registers furnish proof of kinship as well as a means of enforcing the rules of ecclesiastical law which forbade the marriage of relatives.[1]

2. SYSTEMATIC ECCLESIASTICAL REGISTRATION

As early as A.D. 720, there appears to have been a system of registration for births, deaths, and marriages in some parts of Japan. It is not known whether this system was religious or secular, but it is known that Buddhist temple registers were established in that country in 1635.

In Europe, the beginning of systematic vital registration may be traced back to Spain in the fifteenth century when Cardinal Ximenes, Archbishop of Toledo, provided for the introduction of registers which were to be maintained regularly by the parish priests. In 1538, by order of Thomas Cromwell, Vicar General under Henry VIII, the clergy of England were required to record baptisms, marriages, and burials. France, by the Ordinance of Villers-Cotterets in 1539, required the curates to keep registers of baptisms and burials, a measure which by the Council of Trent in 1563 was ex-

[1] See chronological history, annex 1, p. 213.

tended to marriages. By 1608, the first systematic parish register was established in Sweden, followed by similar registers in Canada (Quebec, 1610), Finland (1628) and in Denmark (1646).

3. Civil registration

But all of these developments were still in the church, still governed by religious orders, and still related essentially to the ceremonies of baptisms, burials, or weddings. It remained for the New World of the Western Hemisphere to introduce civil registration—the first such system being the registers of births and deaths established by the Incas in Peru,[2] and the second, the civil legislation introduced in the Colonies of Massachusetts Bay and New Plymouth in the early seventeenth century (1639).[3] In England and on the Continent, as noted above, the *ecclesiastical* authorities were in charge of registration; but in Peru and in these two British colonies, government clerks were made the record keepers and, still more important, births, deaths, and marriages were recorded rather than baptisms, burials, and weddings. Thus, Massachusetts became the first state in the Christian world to record the actual events and the dates thereof, rather than the occurrence and date of the subsequent ecclesiastical ceremonies, and the first to place this registration function under the civil authorities rather than under the clergy.

The secularization of vital registration continued with the adoption of the Napoleonic Code in the France of 1804. The civil section of this Code, which was destined to influence strongly the development of vital-registration systems throughout Western Europe, Latin America, and the parts of the Middle East which came under French influence, placed the responsibility for recording births, deaths, and marriages on the state. It set forth exact provisions for determining who should report the event, who should record it, and what the record should include. All of the provisions of the civil code were concerned with the legal or civil rights of an individual, because civil rights could be granted only by the state and proof of one's claim to such rights was dependent on official registration. Thus, the "legal" purpose for which civil registration of vital events was designed began to assume an importance which was to increase in subsequent years. Moreover, the "individual" as the unit of the vital registration system was established firmly by these codes.

4. Vital statistics

Although registration of births, deaths, and marriages was an established fact in England in 1538 and in most countries of the rest of Europe by the early seventeenth century, vital records were not used for other than legal purposes until John Graunt in 1662 saw the possibilities of using the "bills of mortality" for another purpose. Using these rudimentary lists, Graunt derived and published a series of inductive observations under the title *Natural and Political Observations Mentioned in a following Index, and made upon the Bills of Mortality,*[4] which constituted the first modern use of the registration method for obtaining statistical information. It is true that counts of births and deaths had been maintained for military and fiscal purposes in Egypt, Rome, Greece, and in Peru, but the systematic analysis of registration statistics as we know it began with John Graunt.

Possibly influenced by John Graunt's work, several cities in Germany, notably Brandenburg in 1684, began an annual accounting of births, deaths, and marriages from registration records. In France, the statistical utilization of the registers of the parishes became possible with the declaration of 9 April 1736 which required the curates, vicars, parish priests, and other church officers, to deposit with the bailiwick every year a duplicate of their registers of baptisms, burials, and weddings and provided that records of deaths of persons not accorded ecclesiastical burial be kept by the police officers.[5] This was augmented in 1772 by a circular addressed by the Abbé Terray to the *intendants* requesting them to prepare from the register each year beginning 1770 a resumé of births, deaths, and marriages which had occurred in their districts. Thus, to Terray goes the credit for initiating the permanent and regular counting of *actes de l'état-civil* in France — a system which was maintained up to the beginning of the twentieth century.

In spite of these examples of the use of registration records for statistical purposes, the subject received only fragmentary and desultory treatment until 1839 when Dr. William Farr became "Compiler of Abstracts" in the newly created General Register Office of England and Wales. The impact of this great vital statistician has been described[6] as follows:

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[2] According to Garcilasso de la Vega (born 1539 in Cuzco of an Incan mother and a Spanish father), the Incas, who had no written characters for simple sounds, used intertwining of coloured strings and knots to record facts. These record-keeping mechanisms known as *quipus* were in charge of *Quipucamayus* who "noted, by means of the knots, all of the tribute that was given to the Inca every year, specifying each household and its peculiar mode of service. They also recorded the number of men who went to the wars, those who died in them, those who were born and those who died in each month". (*Royal Commentaries* by Garcilasso de la Vega. Reprinted in *The Ancient Quipu or Peruvian Knot Record,* by Leslie Leland Locke. The American Museum of Natural History, 1923, p. 41.)

According to William H. Prescott, information on the resources of the country and on the character of the inhabitants of the different provinces "was obtained by an admirable regulation, which has scarcely a counterpart in the annals of a semi-civilized people. A register was kept of all the births and deaths throughout the country, and exact returns of the actual population were made to government every year, by means of the *quipus* . . ." (*History of the conquest of Peru, with a preliminary view of the civilization of the Incas* by William H. Prescott, 2nd ed. In two volumes. London, Richard Bentley, 1847. Vol. 1, p. 50.)

[3] "The Registration Laws in the Colonies of Massachusetts Bay and New Plymouth" by Robert R. Kuczynski. *Publications of the American Statistical Association,* Vol. 7 (New Series), No. 7. Boston, September 1900. p. 1-9.

[4] *Natural and Political Observations Mentioned in a following Index, and made upon the Bills of Mortality,* by John Graunt. 4th ed. Oxford, printed by William Hall, for John Martyn and James Allestry, Printers to the Royal Society, 1665.

[5] "The Development and Progress of Statistics in France" by Fernand Faure. *The History of Statistics — Their Development and Progress in Many Countries,* collected and edited by John Koren. Published for the American Statistical Association by The Macmillan Co. of New York, 1918. p. 262-265.

[6] *Vital Statistics: A Memorial Volume of Selections from the Reports and Writings of William Farr, M.D.* Edited for The Sanitary Institute of Great Britain by Noel A. Humphreys. London, 1885. p. xii-xiii.

"Dr. Farr was appointed to the General Register Office on 10 July 1839. . . . The next 40 years of his life were almost exclusively devoted to the, to him, congenial task of creating and developing a national system of vital statistics, which has not only popularized sanitary questions in England in such a manner as to render rapid health progress an accomplished fact, but which has, practically, been adopted in all the civilized countries of the world."

There is no question but that this is an altogether valid evaluation of Dr. Farr's influence. His penetrating analyses of the deficiencies in, and the methods of improving vital statistics, as well as his conclusions as to the implications to be drawn from them, are still models for workers in the fields of public health and demography.

B. Methods of obtaining vital statistics systematically

1. The registration method

Because, historically, vital statistics have been either wholly or partially derived from information obtained at the time when the occurrence of a vital event and its characteristics were inscribed in a register for legal purposes, they have come to be known also as "registration statistics," that is, statistics obtained by the registration method. The term "registration method" describes the procedure employed in gathering the basic observations upon which vital statistics are based, and is used in contradistinction to the "enumeration method" which produces population and other census or survey statistics, or the "administrative method" which produces statistics as a by-product of management controls as, for example, statistics of foreign trade from ships' manifests or customs declarations.

The registration method may be defined as the continuous and permanent, compulsory recording of the occurrence and the characteristics of vital events, primarily for their value as legal documents and secondarily for their usefulness as a source of statistics. An examination of the component parts of this definition will clarify the basic differences between this method of making observations for a statistical inquiry and other methods which have been used.

Consider first the "continuous" aspect. Vital statistics are not prevalence but *incidence* statistics — statistics which provide a measure of the occurrences of certain events during or within a specified period of time and, moreover, provide this measure currently. Experience has shown that the only successful method of obtaining a continuous and current record of events which occur throughout a period is the registration method. In order to ensure the current nature of the statistics and their accuracy with respect to dates and characteristics, the registration record should be drawn up as soon after the occurrence of the event as possible. It is apparent that the simplest and quickest way of accomplishing this end is to require the informant to provide the information as soon as the event occurs.

The continuous aspect of registration implies also the permanence of the procedure. Registration maintained for short periods and then allowed to lapse will not produce vital statistics which are useful as current incidence statistics.

Continuous, permanent recording of vital events can best be ensured by means of legislation which makes registration compulsory. Such legislation should also provide sanctions for the enforcement of the obligation. Thus, it will be seen that the registration method is characterized not only by the continuous character of the observations, but also by the compulsory nature of the method. Both provisions are fundamental.

It may be noted that the definition of the registration method given above is applicable equally to ecclesiastical and to civil registration. Determination of the means by which the continuous, permanent, and compulsory provisions are implemented is not requisite to the method. Ecclesiastical registers are set up under religious law, while civil registers operate under civil law. The registration method of obtaining vital statistics is possible under either.

2. The enumeration method

(a) *Census enumeration*

Because of the fact that registration of vital events for legal purposes is an almost universal requirement, statistical processing of registration records has become the accepted or conventional method of producing vital statistics. Nevertheless, alternative methods have been in use from time to time, notably in those countries of the North American continent in which vital registration is considered solely within the competence of each state or provincial government. The attempts made by Canada and the United States to obtain national vital statistics from the population-census enumeration may be of interest. The two histories are very similar.

Canada. In Canada, interest in public health began to emerge in the early eighteen eighties, and naturally this interest focused attention on mortality statistics. However, as R. H. Coats noted,[7] the recording of births and deaths up until 1883 had been the "unchecked and unrewarded" responsibility of clergymen, coroners, clerks of townships, clerks of peace, and so forth, with the result that registration was far from complete. Obviously, some other method of producing mortality statistics seemed required.

In addition to unsystematic registration, the number of births and the number of deaths together with their causes had, from an early year, been collected on the population census schedule. It was thought that once every ten years this enumeration of births and deaths would provide an over-all check on the registration, but results were so poor that in 1911 the method was discontinued. From that time forward, every effort was devoted to establishing the registration method by improving and standardizing the provincial legislation with the aim of securing uniform registration laws and procedures throughout the provinces.

United States. A similar history obtains in the United States. In recognition of the importance of mortality statistics, the Act of 23 May 1850 required the return, by the canvassers of population, of all deaths

[7] "Beginnings in Canadian Statistics" by R. H. Coats. *The Canadian Historical Review*, Vol. XXVII, No. 2, Toronto, June 1946. p. 120.

occurring during the census year.[8] But despite the good intent, statistics of mortality obtained through the census were always defective as shown by the absurdly low ratios of deaths to population which resulted from this method. It was not possible, however, to know how defective the record was until some basis for comparison existed. Such a basis became available when the registration area for deaths was established in 1880 — an area comprising at that time the two States of Massachusetts and New Jersey, the District of Columbia, and 19 cities, the combined population of which was 8,538,366 — 17 per cent of the United States total.[9] In 1880, a death rate of 19.8 was obtained for this area by the registration method, while in the remaining States and cities, which in effect constituted the "non-registration area," a rate of only 13.5 was computed from the census returns. In1890, the comparative rates for the two areas were 19.6 and 10.6; for 1900, 17.8 against 11.2. It was abundantly clear that the census method would not give results comparable in accuracy with the method of continuous registration, and the mortality census schedule was abandoned after the census of 1900. From that time onward, efforts were concentrated on developing vital statistics by the registration method.

The fundamental deficiency of the census method for collecting vital statistics is that it can, at best, produce returns for the census year and no other. Census years are usually ten years apart. For the intercensal years, current vital statistics are not produced by the census method and, thus, that method fails in the first and minimum requisite for vital statistics, i.e., the production of data on a current basis.

Not only does the census method fail to provide intercensal data but, as seen above, it fails also to record completely the occurrence of births and deaths even for the census year. In some cases, the census enumerator may fail to ask the question or, if he asks it, he may misunderstand the answer or record it incorrectly. The answer of the respondent, on the other hand, is affected by the factor of memory. Because of the long retrospective period involved — a year ending with the date of enumeration — the informant may fail to recall the *fact* of the event, but more especially, he may fail to recall correctly the *date* of its occurrence, with the result that the birth or death, if reported, may be allocated to the incorrect time period. In the reporting of the birth and death of infants who are born alive and die within the same calendar year, the effect of the memory factor may be extremely important. It is well known that infants are generally underenumerated. Moreover, in a small-scale investigation[10] of the problems involved in the enumeration procedure as a means of collecting information about deaths, memory was found to be a significant factor especially in connexion with infants who had been born and died in a hospital. Apparently, such infants were never consciously recognized as members of the household.

With respect to deaths of adults, the event itself may have removed the last member of a family, with the result that the death would go unreported at the time of a subsequent enumeration. A somewhat similar result would occur when a death breaks up a family and scatters the surviving members. Since the enumeration of population and hence the filling of a census mortality schedule is on a family basis, the likelihood of such a death being reported at the time of the enumeration is diminished by the disruption of the family. This particular effect is intensified in the case of deaths in boarding houses or hotels, the members of which households are so loosely associated that the chances of deaths being remembered and reported at the census are slight.

Quite aside from the underenumeration and the consequent deficiencies of coverage in terms of recording all vital events which occurred in the specified period, there is the problem of the adequacy of the information about each event which can conveniently be obtained by the census method. Only a limited amount of information can be requested at a census if the cost of the procedure is not to be prohibitive and if the returns are to be manageable. Therefore, except for the most general inquiries, many details of medical or public-health interest most likely could not be included on a census schedule.

The recognized decrease in trustworthiness of data with the passage of time must also be borne in mind in evaluating the enumeration method. Details recorded immediately, or within a short interval after the occurrence of the event, naturally tend to be more accurate than those dependent on memory.

(b) *The survey*

The census method of securing vital statistics is one example, and the most extensive, of the retrospective type of survey by enumeration. The census method, which takes advantage of the census organization, usually requires reports on the experience of one calendar year preceding the date of the enumeration. Since faults of memory are an important factor in the success or failure of this type of procedure, there is reason to believe that results might be improved if a shorter period of experience were investigated. However, because of seasonal variations, vital statistics are required for time periods which together can produce an unbroken series of data for an annual period. To produce annual data by the survey method using shorter retrospective time periods would, therefore, require a number of contiguous surveys distributed throughout the year.

In meeting these requirements, the basic advantage provided by the census, that is, the advantage of an existing nation-wide organization manned by trained personnel, would of course disappear, and the ultimate cost of replacing the registration method by continuous surveying would be prohibitive. If sampling is resorted to, as it usually must be in surveys for reasons of economy, there is the problem of designing the sample in such a way that due consideration is given to population differentials and mobility and so as to provide data for the small geographic units which are the necessary basis of public-health work. Because of such factors, the survey method appears to be ill-suited to the collection of vital statistics on a routine and permanent basis.

[8] *The Federal Registration Service of the United States: Its Development, Problems, and Defects,* by Cressy L. Wilbur. Department of Commerce. Bureau of the Census. Gov. Print. Off., Washington, 1916. p. 8.

[9] For a review of the growth of the "registration areas," see chapter XII, p. 165, 204.

[10] Conducted in the District of Columbia by the United States National Office of Vital Statistics in 1949.

Periodic surveys have been employed, however, to secure *ad hoc* information on births and deaths in areas where the registration method has not yet been established or where it is very defective. In such situations, surveys have the distinct advantage of making available some vital statistics not otherwise obtainable and of securing at the same time the corresponding population.

A very good example of the application of the survey method in an under-developed area is found in the experience of Southern Rhodesia. The impossibility of conducting a complete enumeration of the widely scattered, illiterate population of this largely unmapped territory, and of establishing a registration system which could produce vital statistics in the near future, led to the application of sampling survey methods. Beginning in August 1948, enumeration of sample villages was carried out by trained field staff, aided by interpreters. The information collected included (1) the total number of persons who had died during the twelve months preceding the field officer's visit, and (2) from each female over puberty (*a*) the number of live births she had had during the previous twelve months and (*b*) the number of children under 1 year of age who had died during the previous twelve months. The natality rates which were derived appeared to be somewhat overstated, while the general and infant mortality rates varied widely from district to district. At the time of the reports quoted, the results of the survey awaited more intensive study and the returns from the next survey.[11]

The use of sample surveys to obtain demographic information for India has been described by P. C. Mahalanobis and Agit Das Gupta of the Indian Statistical Institute, in a paper (United Nations document E/CONF.13/294) prepared for the World Population Conference held in Rome, 31 August-10 September 1954.

3. Analytical method — estimation of vital rates using census data

If it is assumed that the derivation of birth, death, and marriage rates is the object of collecting vital statistics, then there is still another method which could be employed to yield these bare facts. This method is a mathematical one, based on an analysis of the returns of two consecutive censuses of population. The census returns employed must of necessity be the result of very accurate and dependable enumerations, which have produced reliable age and marital-status distributions of the population. If certain assumptions are made regarding migration and the reliability of the enumeration is assured, data from censuses of population can be used to derive information on the approximate number of births, deaths, and marriages which have occurred in this population over the intercensal period. This indirect method yields aggregates only and these solely for the year of the census. It does not, therefore, justify its consideration as a method of developing vital statistics which by definition must be current and continuous. However, it is a method which has been developed for estimating vital statistics in Brazil[12] for example and, as such, should be mentioned for its applicability to the relatively rare areas which have non-existent or deficient registration statistics but a reliable census of population.

4. The vital statistics system defined

It will be clear from the above discussion that to meet the criterion of providing reliable annual, national and local vital statistics on a continuous basis and with the least expense, the registration method has no peer. When in addition, the need for vital records for their legal value is recognized, the development and maintenance of registers for both legal and statistical purposes emerges as the method best adapted to producing vital statistics. Surveys in connexion with the census enumeration of population or on an *ad hoc* basis can be used as interim arrangements to secure current estimates of vital rates or for evaluating the efficiency of the registration system but, in the last analysis, the firm and permanent basis for vital statistics must be registration records.

The merits of the registration method set forth above scarcely take into consideration the fundamental fact which is the compelling need for vital records themselves. Even if equally adequate vital statistics could be obtained as efficiently by the enumeration method mentioned above, the indispensable nature of the original record of birth, death, marriage and divorce would remain.

Once the premise is accepted that the registration method is the cornerstone of vital statistics, one may proceed to a consideration of the vital-statistics system itself. The word "system" usually implies the interaction of component parts to fulfil a common purpose. This is precisely the meaning it is meant to convey in connexion with vital statistics.

Functionally, according to this concept, a vital-statistics system begins with the legal registration of vital events and culminates with the distribution of vital statistics to the potential users. In between, there is found (1) statistical recording and reporting which is the procedure of transcribing registered data for statistical purposes and of transmitting them to the statistical authorities, (2) the collection process, which brings together and controls the receipt of the statistical reports on vital events, (3) the compilation procedure which embraces the classifying and tabulating of the observations, (4) the presentation of the statistics in tabular or graphic form, and (5) the analysis of these data in terms of the problems to be studied.

In order that these independent yet interrelated functions may be clearly discussed, the meanings of the various technical terms as used in this *Handbook* have been set forth in a glossary, in annex 2, p. 228.

The vital-statistics system defined above in terms of functions still requires definition in terms of "events". It will be recalled that, in the beginning, vital statistics were concerned with baptisms, burials, and weddings. Although, with the coming of civil registration, marriages were often included in the original registration acts, the public-health concept which dominated the

[11] "Sampling Surveys in Central Africa" by J. R. H. Shaul. *Journal of the American Statistical Association*, Vol. 47, No. 258, June 1952. p. 239-254. "Sample Census of the Indigenous African Population 1948". *Economic and Statistical Bulletin of Southern Rhodesia*. Central African Statistical Office, Vol. XVII, No. 8, 21 July 1949. p. 7.

[12] *Methods of Using Census Statistics for the Calculation of Life Tables and Other Demographic Measures (with Applications to the Population of Brazil)*, by Giorgio Mortara. United Nations. Department of Social Affairs. Document ST/SOA/Series A/7, November 1949. 60 p. (Sales No. 1950.XIII.3)

growth of vital statistics in Europe and the Americas tended to limit the field to statistics of deaths and to a lesser degree to statistics of births. Statistics of marriages were considered somewhat secondary in importance, while those of divorce did not even exist in many cases. This restrictive influence of public-health dominance on vital statistics is set forth in *Measures Relating to Vital Records and Vital Statistics,*[13] in which it is said that:

> "To consider vital statistics as entirely a concern of public health not only overlooks historical precedents from colonial days, but fails to meet present-day necessities for stressing the 'competent evidence' character of vital records. At the same time, this concept tends to limit the subject matter of vital statistics to birth and death registration, since marriage and divorce registration can be considered only remotely as a public-health measure."

But just as public-health needs for vital statistics aided the substitution of "deaths" for "burials" and "births" for "baptisms", the need for statistics to meet the requirements of demographers — whose interest was and is primarily population movement and analysis — has tended to broaden the field beyond the confines of public health. In response to all of these needs — which are set forth in detail in chapter II — "vital statistics" has come to mean statistics of live birth, death, foetal death (stillbirth), marriage, divorce, adoption, legitimation, recognition, annulment and legal separation.

In summary then, it may be said that the vital-statistics system includes the legal registration, the statistical recording and reporting of the occurrence of, and the collection, compilation, presentation, analysis, and distribution of statistics pertaining to "vital events," i.e., live births, deaths, foetal deaths, marriages, divorces, adoptions, legitimations, recognitions, annulments and legal separations. From time to time, events other than those mentioned here may be recorded and processed in the vital-statistics system of a country, or priority may be given to the registration of only certain events of those mentioned. Nevertheless, statistics on all of the events mentioned should represent the goal of the vital-statistics system. This concept of the vital-statistics system has been given international approval in Principle 101 of the United Nations *Principles for a Vital Statistics System.*[14]

C. Present status of vital statistics

It is clear from the history of vital statistics that the establishment of vital registration, civil or ecclesiastical, does not always guarantee that vital statistics will be forthcoming. It will be recalled that over 100 years elapsed from the initiation of registration in England in 1537 to the first use of vital records for statistical purposes by John Graunt in 1662. Moreover, the establishment of a vital-statistics system does not guarantee the production of reliable or useful vital statistics. In some cases, vital statistics are produced currently with no regard for the fact that they are inadequate to meet many national needs and unreliable for international comparison. These defects may be classified into three general types as follows:

1. Complete absence of data

In order to gain some rough conception of the past availability of vital statistics, we may quote the estimates made by Walter F. Willcox.[15] According to Willcox, by 1833, births and deaths were being registered for less than 100 million people, or about one tenth of the world's population. During the ensuing 100 years, that is, by 1933, nearly 1,000 million, or one half of the world's population, were part of a "world-registration area" and were required to register births and deaths. Although it by no means follows that vital statistics are available whenever vital events are registered, by inference, vital statistics could also have been available for one half the world. Mr. Willcox' estimates terminate here, but if one analyses the coverage of the United Nations *Demographic Yearbook* which publishes essentially all available vital statistics, it is found that the tables on total births and deaths for the period 1935-1950 include data for 132 areas, representing 55 per cent of the world's population in 1951. These data, substantiating Mr. Willcox' estimates, would indicate that some 300 years of experience have resulted in the establishment of vital-statistics systems which can produce minimum results for only a little over one half of the world's population. The need for developmental measures is obvious.

2. Fragmentary data

Fragmentary data may be the result of one or more of at least three major causes. The first of these may be described as incomplete geographic coverage at the national level, that is, exclusion from final tabulations of reports from certain parts of the country, in an attempt to improve the quality of the tabulations by limiting them to areas of known reliability, or by restricting registration to selected areas. The unsystematic and sporadic collection of reports from subnational areas may also be a factor in incomplete geographic coverage.

Incomplete ethnic coverage, which is usually due to the exclusion of certain racial or ethnic groups from the provisions of the registration law or to failure to enforce registration and reporting for such groups, constitutes a second cause of fragmentary data.

Finally, and perhaps the most fundamental though often unrecognized cause of fragmentary information, is a general deficiency or incompleteness of registration and a consequent shortage in the number of events tabulated.

3. Non-comparable data

Lack of international comparability in the matter of definitions and concepts is a third major defect of vital statistics, and this may extend through the definition of the events to the definition of informational items as simple as "age" and as complex as "cause of death". Variation in the number and types of items on which data are collected and the manner in which these items

[13] *Message from The President of the United States Transmitting Report of the Bureau of the Budget.* House Document No. 242, 78th Congress, 1st Session. Gov. Print. Off., Washington, 1943. p. 98.

[14] *Principles for a Vital Statistics System; Recommendations for the Improvement and Standardization of Vital Statistics.* United Nations. Statistical Office. Document ST/STAT/SER. M/19, 26 August 1953. p. 4. (Sales No. 1953.XVII.8)

[15] *Studies in American Demography* by Walter F. Willcox. Ithaca, Cornell University Press, 1940. p. 200.

are coded, classified, and tabulated, add to the potential lack of comparability.

Lack of internal (national) comparability may be due to the same factors of dissimilar definitions, concepts, codes, classification schemes, and tabulating procedures as are operative at the international level. Statistics produced by a decentralized national system are particularly subject to this type of defect, although even in a centralized system the changing of concepts and definitions over time introduces lack of comparability into a time series for the same area.

The present status of vital statistics throughout the world may, therefore, be summarized as follows. For a large segment of the world's population, vital statistics are non-existent; for another, they are fragmentary for one reason or another; for the third group of countries, vital statistics are obtainable, but the accuracy or quality of the fundamental information varies over a wide range and the definitions, concepts, and classifications employed are not always comparable from country to country or even from one part of a country to another. These various factors which contribute to the present imperfect status of vital statistics will be discussed in detail in subsequent chapters. Irrespective of the cause involved, the fact remains that vital statistics for a large proportion of the world's population are deficient and measures designed to improve these data are desirable.

D. History of international action

Although progress in the development of vital statistics has been notable in a number of countries, any attempt to assemble national data on an international basis has been hampered by the lack of comparability, both evident and hidden. Among the first international attempts to improve the situation was the work of the International Statistical Institute.

1. The International Statistical Institute

Probably the first recognition of the need for internationally comparable vital statistics was expressed in the desire for a uniform classification of causes of death. This recognition, which antedated the first international compendium of vital-statistics data by some 60 years, came about at the first International Statistical Congress in 1853 at Brussels when the Congress requested Dr. William Farr and Dr. Marc d'Espine to prepare *une nomenclature uniforme des causes de décès applicable à tous les pays*.[16]

Revision of the two resulting classifications in 1864, 1874, 1880, and 1886 provided the basis for the "International List of Causes of Death", the preparation of which became the responsibility of the International Statistical Institute in 1891. Subsequently, in 1928, a "Mixed Commission" representing the Institute and the Health Organisation of the League of Nations took over the responsibility for the list and, in 1946, its development became a function of the World Health Organization (see also p. 10).

In addition to its work on the "International Lists of Causes of Death", the International Statistical Institute devoted part of each of its sessions to a consideration of demography in general. Recommendations on various procedures relating to population and vital statistics were adopted over the years, those of the first thirteen sessions being reprinted as a supplement to volume XIX of the *Bulletin*[17] and the remainder in volumes XXI-XXIX. These recommendations dealt with almost every facet of the compilation of vital statistics, including basic tabulations and standards for tabular presentation.

In addition to its work of formulating standards and recommendations, the International Statistical Institute began to publish an *Annuaire International de Statistique*, the first of which appeared in 1916.[18] Being fully aware that the data presented in the *Annuaire* were not strictly comparable, the International Statistical Institute came to the conclusion that their value could be enhanced by a review of the organizational patterns and procedures which produced these data in the various countries. Accordingly, a tabular review of procedures in 43 areas was appended as an annex to volumes I-V of the *Annuaire* of 1921 under the title *Renseignements sur l'organisation actuelle des statistiques de l'état civil dans divers pays* (1921).[19] A revision of the 1921 review was subsequently issued by the International Statistical Institute in 1929 under the same title as the earlier one. Both of these tabulations sought to summarize the fundamental elements of the vital-statistics systems and to present them in a simple reference table. They were eminently successful, and their current usefulness is invalidated only by changes in the national systems themselves.

2. League of Nations

The Health Organisation of the League of Nations attacked the problem of variation in the registration and compilation of vital statistics by studying in detail and at first hand the individual systems and procedures in selected countries. A comprehensive report on each country, including a section on vital statistics and sections on census and morbidity statistics, was published between 1924 and 1930.[20] These surveys still constitute the only intensive studies of this type available for ready reference.

A second important contribution of the League of Nations to the improvement of vital statistics was the proposal in 1925 of international definitions of live birth and of stillbirth, both of which are set forth in chapter IV, p. 47 and p. 59 respectively. Supplementing this important step toward standardization was the work done in conjunction with the International Statistical Institute on revising the "International Lists of Causes of Death" and in developing a standard medical certificate with rules to govern the choice of the cause of death to be tabulated when more than one were given. A word should also be said about the *Statistical Year-Book of the League of Nations*,[21] part I of which was

[16] *Sixteenth Annual Report*, 1856. Registrar-General of England and Wales. Appendix 73.

[17] *Texte des vœux émis par l'Institut International de Statistique dans les treize premières sessions* by H. W. Methorst. (Supplement to Vol. XIX of the *Bulletin de l'Institut International de Statistique*.) The Hague.

[18] *Annuaire International de Statistique*, publié par l'Office Permanent de l'Institut International de Statistique. I. *Etat de la Population (Europe)*. La Haye, 1916. 166 p.

[19] A somewhat similar tabulation had appeared in 1907, published by the *Statistique Générale de France*.

[20] *Statistical Handbooks Series*. League of Nations. Health Organisation. Nos. 1-14, Geneva, 1924-1930.

[21] *Statistical Year-Book of the League of Nations*, 1927-1942/44. Economic Intelligence Service. Geneva.

devoted to "Population and Vital Statistics", and which demonstrated the non-comparable nature of the data through the use of extensive footnotes. General notes preceding each table served to indicate the principal sources of non-comparability, but no attempt was made to analyse divergencies in terms of procedures or to recommend standard methods.

3. Pan American Sanitary Bureau

Since its foundation in 1902, the Pan American Sanitary Bureau has been concerned with establishing among its Member States uniformity and completeness of reporting, not only of morbidity but of vital events. The "Regulations"[22] of the Pan American Sanitary Bureau are concerned primarily with reporting of communicable disease and the status of sanitary conditions and, hence, have had little effect on developing vital registration or vital statistics. However, the provisions of the Sanitary Code together with the resolutions on vital statistics emanating between 1902 and 1926 from the Conferencias Sanitarias Panamericanas and since 1926 from the Conferencias Panamericanas de Directores Nacionales de Sanidad, should be included among recommendations made in this field. Among these may be found recommendations relating to the adoption of the "International List of Causes of Death", on the notification of births and deaths, on the certification of cause of death, and so forth.

4. Inter American Statistical Institute

In addition to sponsoring the programme of the 1950 Census of the Americas, the Inter American Statistical Institute, founded on 12 May 1940 during the Eighth American Scientific Congress in Washington, maintains a continuing interest in furthering the development of national vital statistics. During its first session in September 1947 in Washington, the Institute approved two resolutions of its Committee on the 1950 Census of the Americas,[23] which dealt with vital statistics. These were Resolution No. 13 on the "Reorganization of Civil Registers" and Resolution No. 14, "Test of the Completeness of Birth Registration in the 1950 Census".

At the Second Inter-American Statistical Congress in Bogotá, January 1950,[24] a number of resolutions in the field of demography were approved, among which was No. 16 devoted to "Improvement and Development of Vital and Health Statistics". This resolution included recommendations on the establishment of National Committees on Health and Vital Statistics (see also chapter III), the utilization of the International Statistical Classification of Diseases, Injuries and Causes of Death, and the adoption of "International Standards and Forms" for recording births, deaths, stillbirths, marriages, and divorces.

5. World Health Organization

Under its Constitution, the World Health Organization (which in effect replaced the Health Organisation of the League of Nations) is required "to establish and revise as necessary international nomenclatures of diseases, of causes of death and of public health practices".[25] In accordance with this responsibility, the First World Health Assembly in 1948 adopted the Sixth Revision of the International Lists of Diseases and Causes of Death, known as the "International Statistical Classification of Diseases, Injuries, and Causes of Death", which had been developed and approved by the "International Conference for the Sixth Decennial Revision".[26]

Together with the "Classification", the Assembly adopted, under Article 21 (*b*) of its Constitution, regulations to embody the recommendations of the Conference and to ensure international application of the "Classification". The regulation which is known as "World Health Organization Regulations No. 1 Regarding Nomenclature (Including the Compilation and Publication of Statistics) with Respect to Diseases and Causes of Death" was adopted on 24 July 1948 to ensure "as far as possible the uniformity and comparability of statistics of diseases and causes of death".[27] The first 12 Articles of these Regulations cover instructions for the compilation and publication of mortality statistics by cause, for medical certification of cause of death, and for the selection of the main cause for tabulation. Articles 13-16 deal with the compilation and publication of morbidity statistics. The remaining eight Articles are non-technical in nature. Specific reference to these Regulations will be made throughout the *Handbook* as appropriate.

Under Article 9 of the Regulations, countries are obligated to adopt a medical certificate of cause of death which conforms as far as possible to the International Form of Medical Certificate of Cause of Death. A number of recommendations and instructions to physicians on the use of the form are contained in the *Manual,* and supplementary instructions and amplifications have been set forth in Supplements 3, 4, 5, and 6 of the *Bulletin of the World Health Organization.*

In the realm of standard definitions, the World Health Organization Expert Committee on Health Statistics through its Subcommittee on Definitions of Stillbirth and Abortion developed, in 1950, an international standard definition of live birth and of foetal death, both of which were adopted as recommendations under Article 23 of the Constitution and Article 17 of the Regulations by the Third World Health Assembly,

[22] The Pan American Sanitary Code, signed in Havana, Cuba, 14 November 1924, during the Seventh Pan American Sanitary Conference. (*Transactions of the Seventh Pan American Sanitary Conference of the American Republics,* held in Havana, Cuba, 5-15 November 1924. Pan American Sanitary Bureau, Washington, 1925.)

[23] *Proceedings of the International Statistical Conferences, Vol. IV.* (First Session of the Inter American Statistical Institute, 6-18 September 1947, Washington). Resolutions, p. 31-34. Mexico, 1948.

[24] *Second Inter-American Statistical Congress, Bogotá, January 1950: Summary and Resolutions.* Preprint from *Estadística,* Journal of the Inter American Statistical Institute, Vol. VIII, No. 26, March 1950.

[25] Chapter II, Article 2(s) of the Constitution of the World Health Organization, adopted 22 July 1946 by the International Health Conference convened by the Economic and Social Council of the United Nations in New York City. (World Health Organization, *Official Records,* No. 2, p. 101.)

[26] World Health Organization, *Official Records,* No. 13, Annex 1. The "Classification" is published in the Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death; 6th revision of the International Lists of Diseases and Causes of Death adopted 1948, vol. 1 (World Health Organization, *Bulletin,* Supplement 1), Geneva, 1948.

[27] World Health Organization, *Official Records,* No. 13, p. 349.

20 May 1950. The text of these definitions will be found in chapter IV, p. 46 and p. 60 respectively.

The Subcommittee at its first session also recommended certain tabulations of live birth and foetal death and made suggestions for improving registration in general and particularly registration of foetal deaths, but instead of adopting these, the Expert Committee recommended that the World Health Assembly refer these for study and experimental use in the various nations.[29]

6. United Nations

With the advent of the United Nations, the problems of the development and improvement in the international comparability of statistics in general became the responsibility of the Economic and Social Council and of the Statistical Commission which was established to assist and advise the Council on statistical matters.

The Council in its resolution 2/8 of 21 June 1946 had set forth the official terms of reference of the Commission, and among these was promoting "the development of national statistics and the improvement of their comparability".[29] With respect to demographic statistics, this basic resolution (2/8) was reinforced by resolution 41 (IV) of 29 March 1947, which dealt specifically with fostering the "Improvement of Comparability and Quality of Basic Population Statistics"[30] and, in accordance with this mandate, the Statistical Commission at its fourth session in 1949 requested that a "study [of] the different systems of vital registration [be made] in order to promote comparability of definitions, the adequacy and comparability of classification and tabulations, and the development generally of effective registration systems".[31]

Also the Population Commission at its third session in 1948 had requested the Secretary-General to initiate such studies[32] and at its fourth session in 1949 had emphasized the desirability of giving attention to the problems of improving completeness of registration of vital events.[33]

On the basis of these studies, the Statistical Commission at its fifth session in 1950 recommended that the Secretary-General "prepare detailed draft recommendations for the improvement and standardization of vital statistics".[34] The Population Commission endorsed this proposal and noted that the "implementation of these recommendations . . . would improve mortality, fertility and other population data necessary for the study of basic demographic problems and the interrelationships of demographic, economic and social factors".[35]

All of these recommendations culminated in the preparation of a set of recommendations entitled *Principles for a Vital Statistics System,* which were adopted by the Statistical Commission at its seventh session in 1953 and approved by the Economic and Social Council at its fifteenth session in April 1953.[36] For convenience, these *Principles* have been reproduced in annex 2, p. 217.

The *Principles for a Vital Statistics System* are recommendations for the improvement and standardization of vital statistics. They incorporate, where appropriate, the recommendations which have emanated from the World Health Organization and thus may be considered as an internationally recommended and comprehensive guide to preferred definitions, classifications, minimum tabulations, and principles to be followed in the organization and administration of the various phases of the vital-statistics system. It may be noted that this is the first time that international action has provided an integrated set of standards which cover almost every facet of the problem.

Part 1 of the recommendations, consisting of nine Principles, is devoted to the general aspects, including a definition of the system and its function, the designation of official responsibility, the need for co-ordination and evaluation, and the place of sampling, of special surveys, and of record linkage in the vital-statistics system.

A second part deals with principles for legal registration in so far as they relate to vital statistics and includes among its 16 Principles definitions of the events to be registered, a system of priorities of events to be employed in the establishment of a registration system, the optimum size of the registration units, the nature, place, and cost of registration, as well as the allocation of responsibilities.

The third group of nine Principles sets forth recording, reporting, and collecting standards, including recommendations on the form and content of the statistical report for live birth, death, foetal death, marriage and divorce, together with a definition of each item of information to be included.

Part 4, the last section, contains 12 Principles devoted to compilation procedures. In this part, the goal of the compilation programme is given, guides to coverage — both geographic and ethnic — are discussed, certain bases of tabulation are recommended, and an annual tabulation programme suggested. Thus, the major aspects of the vital-statistics system are covered in these four parts of the Principles, and recommendations are formulated for the guidance of any country interested in organizing or evaluating a system for the production of vital statistics by the registration method.

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[28] Expert Committee on Health Statistics. Report on the Second Session, including Reports on the First Sessions of the Subcommittees on Definition of Stillbirth, Registration of Cases of Cancer, Hospital Statistics. (World Health Organization, *Technical report series,* No. 25. p. 4.)

[29] *Official Records of the Economic and Social Council, 2nd Session,* p. 398.

[30] *Official Records of the Economic and Social Council, 4th Session, Resolutions* (E/437), p. 21-22.

[31] *Official Records of the Economic and Social Council, 9th Session, Supplement No. 6* (E/1312-E/CN.3/82), para. 74.

[32] *Official Records of the Economic and Social Council, 7th Session, Supplement No. 7* (E/805), para. 32(i).

[33] *Official Records of the Economic and Social Council, 9th Session, Supplement No. 7* (E/1313), para. 35.

[34] *Official Records of the Economic and Social Council, 11th Session, Supplement No. 4* (E/1696/Rev.1), para. 88(b).

[35] *Official Records of the Economic and Social Council, 11th Session, Supplement No. 7* (E/1711-E/CN.9/62), para. 46.

[36] *Official Records of the Economic and Social Council, 15th Session, Supplement No. 5* (E/2365-E/CN.3/163), Annex 3.

CHAPTER II

USES OF VITAL RECORDS AND VITAL STATISTICS IN THE MODERN WORLD

The establishment or improvement of a system of vital statistics depends on demonstration of the need for such a system. The need for the vital-statistics system will, in turn, be based on a demand for the products which the system will yield. Since registration of vital events is the initial and fundamental component of the system, there should be first a demonstrated use for the product of this function, namely a need for the vital records of live birth, death, foetal death, marriage, divorce, and such other events as may be registrable. Secondly, there should be a well justified need for statistics based on these records. These uses for both records and statistics must be important enough to justify governmental action to meet the needs.

It has been demonstrated that the development of vital-statistics systems in the various countries came about not by chance but in response to needs for records and statistics. The demands for vital records stem from their value as legal documents. The need for legal documents with evidentiary value arose as society became more complex and man began to be required to prove his right to his name, his citizenship, and his place in society, especially with respect to the privileges and duties of a member. The more complex the society, the more uses were found for records to prove facts which in previous years may not have required any type of proof or at the most a verbal certification. It need hardly be pointed out that needs for vital records change with the times.

Recognition of the value of vital records as a source of statistics was slower in developing than was their value as vital records. Vital statistics, like all statistics and unlike vital records, are not ends in themselves but tools for the study and understanding of other phenomena. The utilization of vital statistics as administrative and research tools stimulated both demographic research and public-health planning, with the consequent reciprocal effect on statistics of births and deaths and, to a lesser degree, on those of marriage. Without incentives in the form of important uses which, in their turn, create demands, there would be little reason for governments to establish and maintain expensive vital-statistics systems.

Since the vital-statistics programme in any country requires constant revision and augmentation to adjust it to changing demands, an attempt has been made below to set forth many of the known needs for and uses of the products of the system. This comprehensive discussion is designed to be a check-list or guide for administrators who are seeking the fullest utilization of the vital-statistics system. The discussion is divided into two main sections, the first of which deals with the need for vital records and the second with the uses of vital statistics.

A. Uses of vital records

1. USE TO THE INDIVIDUAL

Records of birth, death, marriage, and divorce, as well as those of legitimation, recognition, adoption, and so forth, are of paramount use to the individual. The basic registration document or a certified copy thereof has legal significance to the person concerned, which is equalled by few of the other documents a man may acquire in his lifetime. A review of the principal uses which the individual makes of records of live birth, death, foetal death, marriage and divorce, namely their use as proof of the *fact*, the *date*, and the *place* of occurrence of the event, will show why this is so. For convenience, the discussion is restricted to the five vital events noted above, but it should be pointed out that records of other vital events such as adoptions, legitimations, recognitions, and so forth, are used in much the same way.

(a) *Live-birth record*

The establishment of the identity of an individual, that is, the proof of the facts of his birth, is probably the most important of the uses to which a birth record can be placed. The birth-registration record is especially adaptable to this role, because it is a legal record and it will normally include the individual's name and that of his father and of his mother, together with certain other identifying information. Legal proof of birth is required primarily for establishing family relationships such as parentage, legitimacy, dependency, ancestry or lineage — any of which might be necessary for settling inheritance or insurance claims or for arranging the transfer of property.

The establishment of rights contingent upon attainment of a certain age is often dependent on the proof of age or, in other words, the *date* of birth. Privileges such as being allowed to enter school or to obtain permission to work — especially in certain industries or in government civil service — are often contingent upon proof of age; as is the obligation to serve in, or the right to be excused from service in, the armed forces; the right to apply for a licence such as that required to operate a motor vehicle or to carry firearms; to enter certain professions; to marry without parental consent; to exercise voting rights; to qualify for social-security pensions payable only at a specified age; to enter into legal contracts; and to establish inheritance rights contingent upon age.

The birth-registration record is also the legal document which will establish nationality or, more correctly, citizenship by birth. It may be necessary to establish such facts in order to obtain passports for foreign

travel; to qualify for voting privileges; to be employed in government service or in restricted industries; to own property; to obtain exemption from alien restrictions, or conversely, if an alien, to obtain exemption from taxes or military service in the country of residence.

(b) *Death record*

The primary use of proof of death registration is, of course, its role in the issuance of a burial permit, for which it is a prerequisite in almost every country of the world. There are, however, other important uses of the proof of death. Settlement of inheritance or insurance claims, for example, requires proof of the death of the decedent, as well as proof of inheritance rights on the part of beneficiaries. Claims for family allowances of various types may be dependent on proof of the death of the family wage-earner.

The date of death of the testator, in conjunction with the date of birth of a legatee, may be required to prove rights of inheritance contingent upon age. It also may be valuable in avoiding inheritance taxes enforced as of a certain date, in disproving paternity, and for other uses, primarily legal in character.

The use of death records to certify to the exact location at which the death occurred may be useful in connexion with accident cases in which some claim is to be made contingent upon place of occurrence. On a geographic basis, proof of place of death in terms of political units might be of importance in connexion with the levying of inheritance taxes or the establishing of inheritance rights in the absence of a will. In some countries, the exact place of death may be significant in establishing the right to be buried or cremated in a specially designated place.

(c) *Foetal-death record*

The record of a foetal death, which proves the *fact*, the *date*, and the *place* of delivery, is of limited use in a legal sense. One possible role which can be visualized is its use in establishing certain legal questions contingent upon family composition and birth order — questions which may deal with rights to inheritance and such.

(d) *Marriage record*

The *fact* of the occurrence of a marriage must be proven to ensure legal responsibility for family support, to establish rights to inheritance or pensions, to confer legitimacy, and to help prove ancestry and lineage. The *date* of marriage, in conjunction with the birth date of offspring, is essential for proving legitimacy and, by itself, to qualify for certain pensions or social-security payments. The date of marriage may also provide indirect or supplementary evidence for the registration of a birth after the expiration of the normal registration period. The *place* of marriage may be a factor in establishing the legality of the ceremony.

(e) *Divorce record*

The *fact* of divorce is required to establish the right to remarry. This is perhaps the principal use of the divorce registration, as it is of the record of annulment, although either may be a factor in inheritance litigation or in obtaining release from financial obligations incurred by the other party. Like that on the marriage records, some information on the divorce records may also be of value as evidence to support a request for a delayed registration of a birth.

The *date* when a divorce became effective is of importance in establishing paternity or the legality of a subsequent marriage. It also may be required to establish rights contingent upon marital status and age and to prove absence of responsibility of a financial nature.

The *place* where the divorce was granted is especially important from the standpoint of establishing the legality of the divorce in other jurisdictions.

2. USE TO OPERATING AGENCIES

Records of births, deaths, and marriages are useful to governmental agencies for a variety of administrative purposes. The most common of these will be presented below in terms of each event.

(a) *Birth record*

Public-health programmes of post-natal care for the mother and the child usually have their starting point in the birth register and the corresponding birth indexes. Next to their legal role, this is perhaps the most important use to which birth records can be placed — a use which has been described in terms of the City of New York as follows:[1]

> "Because it is required that births be reported within two days, it is possible to place sufficient information from birth records in the hands of the visiting nurse so that she can arrange to make a home visit to any mother and child, not attended by a private physician, immediately after their return from the hospital. Every day the Statistical Division of the Bureau of Vital Records sends to each district health center a list of the births to mothers residing in that district as reported the previous day. These lists are prepared from index tabulating cards and give the name, home address, place of birth, color, and sex of each infant born alive, together with information regarding the number of this child in the family, its birth weight, and whether the case was that of a private practitioner or a general service (ward) case. From a study of these lists the visiting nurse in each district determines just which mothers and babies should be called upon and, should selection be necessary, preference is given to those whose records show that they are either first-born or were underweight at birth."

Vaccination and immunization programmes, as well as those for the physically handicapped or premature babies, also can make use of the birth register for their more effective implementation.

(b) *Death record*

Control programmes for infectious diseases within the family and within the community often depend on the death-registration report for their initiation. For example, measures to find cases of tuberculosis within a family may be undertaken upon the registration of the death of a member from that disease. In areas where major epidemic diseases such as smallpox or plague have been eradicated, the appearance of a death from

[1] "The Use of Vital Records in the Reduction of Fetal, Infant, and Maternal Mortality" by Thomas J. Duffield and Louis Weiner. *American Journal of Public Health*, Vol. 32, No. 8, August 1942. p. 803-810.

one of these causes will set in motion a chain of actions designed to uncover all possible contacts which the decedent may have had during the time he had had the disease.

Public-safety, accident-prevention, and crime-eradication programmes make use of the death-registration records in somewhat the same way as does the public-health programme.

The death-registration record also finds a use in clearing social-security files, morbidity-case registers, electoral lists, military-service and tax registers, and in completing records for medical study of disease processes. Police checks for missing persons and curtailment of rationing or benefit programmes which should terminate at death are also partially dependent on the use of death registers.

(c) *Birth, death, marriage, divorce*

The two essential elements of the system of population registers are the universal, simultaneous registration of all residents of a country and the continuous maintenance of individual or family records to show each change in physical, civil, or geographic status, such as change of address or of name, loss or addition to family, and change in marital status. The first element is provided either by the census enumeration of population or by a special registration. The second component of the system is supplied in part by the officially authenticated records of birth, death, marriage, divorce, annulment, and so forth. The role of vital records in maintaining population registers is, therefore, one of their important uses wherever such systems exist.

B. National uses of vital statistics

The multiple uses of the legal record of birth, death, marriage, and divorce in the life of the individual, as well as in the activities of governmental and private agencies which carry out public-health, welfare, and other programmes, have been described above. The legal significance of the records for proving the *fact,* the *time,* or the *place* of the occurrence of an event cannot be disputed. But this important function of providing evidentiary records is not the ultimate aim of the system from the point of view of statistics. Unless the information on the records is used also for statistical purposes, much of its value will be neglected.

For the individual himself, whose needs were met on so many fronts by the record of the vital event, vital statistics hold relatively little interest, except in so far as they may be used as tools in planning, operating, and evaluating programmes. On the other hand, the activities of official governmental agencies, of commercial interests, and of the workers in the public-health field are dependent in a multitude of ways on the statistics derived from vital records. This role of vital statistics in national affairs may be discussed under two principal headings, namely (1) the use of vital statistics as basic elements in research — both demographic and medical; and (2) their role as indispensable elements in public administration and as determinants of administrative action. Much has been written about the dominant needs and priorities of one of these "consumers" with respect to another. But, as will be seen below, there is great need in each field of activity — needs which can be met by no other branch of statistics. Hence, in the development of the vital-statistics system, no single use should be allowed to obscure the others.

1. Vital statistics as elements in research

(a) *Demographic research*

One of the most important uses of vital statistics is their role in the demographic analysis of population for economic and social purposes. The study of population movement and of the interrelationships of demographic with economic and social factors is of fundamental importance to society and will become increasingly more so as the advances in technology and public health focus attention on demographic problems. The three directions which such an analysis may take are (1) population estimation, (2) population projection, and (3) analytical studies.

Population estimation. From the most elementary viewpoint, knowledge of the number of persons inhabiting the earth and their distribution thereon is fundamental. Planning of transportation facilities, agricultural production, production and distribution of economic commodities, employment, housing, and public-health programmes are impossible in the absence of a population base figure. This basic population figure has its origin in the almost universal national censuses of population but, since complete censuses are costly, they are usually carried out only at intervals of ten years. During the intercensal periods, population figures must be estimated with the help of vital statistics. The census figure, increased by births and, if available, immigrants, and decreased by deaths and emigrants, gives an estimate of the population of the area. For this crucial segment of information which makes population estimation possible, the demographer must depend primarily on "human book-keeping"[2] — the accounting of births and deaths which is vital statistics.

To know the size of a population at any chosen moment is desirable and useful for many purposes. But to know also its composition in terms of age, sex, and marital status, for example, is even more desirable in view of the requirements for economic and social research. Vital statistics provide the basis for an annual adjustment of the census enumeration, considering the current mortality, nuptiality, and natality patterns, and producing thereby estimates of population by age, sex, and marital status.

The estimation of population by using data on natural increase is recognized as the most reliable method, provided that the registration statistics are reasonably accurate. The exact techniques and assumptions involved in the method will be found elsewhere,[3] but it should be pointed out that the degree to which application of vital statistics may provide estimates of population distributed by such factors as race, nationality, and so forth, is limited primarily by the amount of detail which is recorded at the original registration, the definitions employed at that time, and the types of tabulations made.

[2] *Vital Statistics and Public Health Work in the Tropics Including Supplement on the Genealogy of Vital Statistics* by P. Granville Edge. Baillière, Tindall and Cox, London, 1947. p. 4.

[3] *Methods of Estimating Total Population for Current Dates,* Manual I of Manuals on Methods of Estimating Population. United Nations. Department of Social Affairs, Population Division. Document ST/SOA/Series A/10, 1952. 45 p. (Sales No. 1952.XIII.5)

For purposes of population estimation, the value of vital statistics, based on complete registration, accurate and prompt statistical reporting, and a broad tabulation programme, cannot be questioned.

Population projections. Important as is the knowledge of the present status of the population, the knowledge of its probable size, geographic distribution, and composition at a future date is even more important for purposes of economic and social planning. Planning in these fields has focused attention on the need for trustworthy projections of population, in turn based on projections of vital-statistics data. The analysis of the effect of the trends of natality, mortality, nuptiality, and divorce on the size and distribution of population and on the formation of families provides the material from which future population estimates may be computed.

Analytical studies. Closely linked with the projecting of population is the use of vital statistics in analysing demographic situations and in predicting future developments. There is also great scientific interest in analysing the size and the course of the birth, death, marriage, and divorce rates to elucidate their influence on various social and political problems within and between geographic areas. Marriage statistics are not of interest solely in relation to the birth rate and to population increase, but also as indicators of national economic trends and of local *mores*. Statistics of births are primarily factors in a study of population size and characteristics, but they also have a bearing on social problems as revealed in studies of legitimacy and fertility by social differentials. Mortality statistics are not only the most complex but also the most interesting indices from the viewpoint of their reflection of public-health and sanitary conditions. The calculation and study of indices such as these as well as life-table functions, reproduction rates, cohort analyses, and so forth, are all techniques for demographic analysis.

All of these analytical techniques demand detailed and consistent series of vital statistics, complete and accurate within and among themselves. The interrelationship of all the demographic factors and, in turn, their individual and combined relationship with economic and social factors, forms the basis of demographic research from which population policy is derived.

(b) *Medical research*

Very closely allied to the role of vital statistics in demographic research are their uses by the medical profession engaged in research. Medical and pharmaceutical research, like demographic research, requires a certain number of guideposts. This guidance may be found in part at least in mortality and natality statistics.

Investigations into such causes of death as pneumonia, cancer, and cardiovascular-renal disease, to name only a few, have been initiated by concern over the loss of human life from these causes, as revealed by the death rates. New remedies have been sought and found to decrease the loss of life from diabetes, for example, while appendicitis as a cause of death has been largely eliminated as a result of the research initiated on the strength of the once-high death rate. Statistics of occupational diseases, such as lead poisoning, have led to the establishment of industrial-hygiene measures. The levels of maternal and infant mortality rates have influenced the medical profession profoundly in its approach to problems of pregnancy and post-natal care.

It may truthfully be said that virtually every large-scale problem in preventive medicine has been brought to light — in part at least — by statistics of death, and further that the adequacy of remedial or curative action is, in the last analysis, reflected in these same statistics. The trend of the tuberculosis death rate in response to streptomycin, that of malaria in response to DDT, and that of the maternal mortality rate in response to the antibiotics clearly delineate the second stage of this process.

2. Vital statistics in administration — public and private

Statistics in general and vital statistics in particular are fundamental elements in public and private administration, which is the machinery and methods underlying all official programmes of economic and social development in either "developed" or "under-developed" areas. According to a study of the standards and techniques of public administration made by a special committee of the United Nations Technical Assistance Administration,[4] "little can be done [in government planning, which may be the most determining influence in any programme of economic and social development or administrative reform] without at least a reasonable minimum of basic data and reliable statistics. . . . Basic statistics will have to be made available in the . . . demographic and social [field] showing births, deaths, [and] morbidity. . . ." The Committee goes on to say that "the most pointed statistics which might help weigh the extent to which progress has been made are the . . . infant mortality and average life span. . . ." No more explicit or far-reaching use could be set forth for vital statistics.

The role of vital statistics in over-all planning and evaluation of economic and social development is the most important use to which this body of data may be placed. However, there are other less far-reaching uses in connexion with specific aspects of a nation's life which are also of major importance. The first of these is the use of vital statistics in the field of public health.

(a) *As used by public-health organizations*

Nationally and internationally, statistics of births, deaths, and foetal deaths are required for planning, operating, and evaluating programmes in the field of public health. Public health has, in the past, relied almost entirely upon statistics of mortality by cause of death and personal characteristics to determine the direction and scope of its programmes. Both progress and regression in the programme are subject to measurement by vital indices. The problem of infant and maternal mortality is reflected in the birth rate, in the infant mortality rate, and in the maternal mortality rate. Other rates are relevant to other aspects of the public-health programme.

Infant mortality. The infant mortality rate is recognized as perhaps the most sensitive index of the

[4] *Standards and Techniques of Public Administration with special reference to Technical Assistance for Under-developed Countries.* Report by the Special Committee on Public Administration Problems. United Nations. Technical Assistance Administration. Document ST/TAA/M/1, 20 November 1951. 65 p. (Sales No. 1951.II.B.7)

effectiveness of health and sanitation programmes, since it measures the loss of life during the first year when environment and personal care are the most influential factors in its maintenance. The infant mortality rate reflects also the effectiveness of public-health nursing programmes and, indirectly, the adequacy of pre-natal care. It is the one rate which can and does serve the local health officer as his programme guide, at least until it is brought within the range where factors other than sanitation and environmental care begin to be prominent.

The magnitude of the pregnancy-wastage problem, involving all foetal, neo-natal, and infant deaths, is one engaging much attention at the present time, and one which is related to the statistics of live birth, stillbirth, and infant death. The definition of "prematurity" at birth, the criteria to be employed, the chances of life under such conditions — all are derived from an analysis of vital statistics tabulated by such characteristics as duration of pregnancy, weight at birth, duration of life, and the like. Correlation of the infant-death reports with the birth record will reveal, in addition, the characteristics of the mother such as age, marital status, race, socio-economic status, and so forth, which may have a bearing on the outcome of the pregnancy.

Foetal mortality. Although true measures of foetal mortality are not yet available, due to problems of definitions and of difficulties in attaining moderately complete registration (see chapter IV), it still remains that such data as are available on "late foetal mortality" have been influential in determining public-health programmes. In countries where infant mortality has been reduced to a minimum, it is obvious that the attention of the medical and public-health profession might well begin to focus on foetal mortality. The foreword to a report on *Major Problems in Fetal Mortality*[5] notes that there is little statistical information available on the subject and that there are many difficulties in obtaining complete statistics on foetal deaths, but it goes on to say:

> "Rough estimates indicate that fetal mortality today represents a medical and social problem of equal or greater magnitude than that of infant mortality at the turn of the century. Because of the progress made in the reduction of infant mortality, the health interests are now in a position to turn their attention to the problems of pregnancy wastage."

Maternal mortality. Excessively high maternal mortality rates suggest a need for further study, not only of the causes of maternal mortality, which is a medical research problem, but of the circumstances under which these deaths take place. In this connexion, tabulations of maternal deaths by type of attendant may reveal that the incidence of maternal deaths among home deliveries is excessive and would, therefore, justify increased appropriations for hospital facilities or other preventive measures. It will be noted that both the infant mortality rate and the maternal mortality rate, which are of such fundamental importance to the health authorities, are based on births (see chapter XIII, p. 189). This means that they are independent of population estimates (or lack of them) which in so many instances, especially for small areas, limits the compilation of public-health indices to census years. In the case of infant and maternal mortality, the health authorities have in the vital-statistics compilations the elements for significant studies. Analyses may be made of the geographic distribution of births; the exact place of occurrence, i.e., in hospitals or clinics, or at home; attended or unattended by a physician or midwife; the socio-economic status of the parents; the age of the parents; and the question of legitimacy. Important statistical elements required for the intelligent planning of programmes for maternal and infant care can be found in the statistics of births and deaths.

Cause of death. In the absence of adequate morbidity statistics, the problems of tuberculosis, cancer, and malaria control, for example, are first delineated in terms of the cause-specific death rates.

Hospitals for the care of tuberculosis patients are usually established as a result of concern for the high incidence of the disease as expressed by the death rate. Private organizations for the control of tuberculosis, for example, utilize the specific death rates to establish the urgency of their programmes and also to evaluate their success or failure. Tuberculosis death rates by age, sex, and race have been useful not only in determining the allocation of funds for research and treatment, but also in directing public-health education through the schools and through the family.

Cancer mortality rates have highlighted the need for adequate medical care and also for research into the causes of the disease and possible new types of therapy. Cancer death rates specific for certain factors such as occupation, race, and age have been used to direct the programmes toward the most effective utilization of resources. They have also been used, as has the tuberculosis death rate, to bring the problem to the attention of the public and to delineate the field in which health education may be most effective.

Statistics on deaths from injurious drugs or from poisoning have been instrumental in obtaining passage of legislation designed to protect the individual. The elimination of lead from a formula for paint used on children's toys and furniture was a direct result of the tracing of deaths from lead poisoning (which showed up in death rates) to the chewing of articles painted with a specific paint.

Communicable diseases, such as malaria and typhoid fever, constitute major public-health problems but they are, fortunately, subject to direct control by public-health methods. The draining of swamps, the screening of houses, the installation of sanitary water supplies and sewers together with provision for their maintenance; the eradication of the vector — all these require first an evaluation of the problem and its geographic distribution.

It may be said that practically every public-health problem — be it environmental sanitation, communicable-disease control, or nutrition — has been revealed more clearly through analysis of vital statistics data. P. Granville Edge has said, *"Vital records are the intelligence services of public health* provided an organized system ensures (*a*) the prompt assembly of reliable

[5] *Major Problems in Fetal Mortality*, by J. Yerushalmy and Jessie M. Bierman. Federal Security Agency, Public Health Service, National Office of Vital Statistics. Vital Statistics — Special Reports. Selected Studies, Vol. 33, No. 13, Washington, 22 May 1952. p. 215.

facts, (*b*) the intelligent interpretation of data, and (*c*) that information thus made available is acted upon with promptitude."[6] Delineation of public-health problems is thus only a first step. With the initiation of programmes to ameliorate conditions comes the need for additional statistics to measure both the progress achieved and the concomitant administrative costs involved. Finally, the evaluation of results and the reassessment of the programme complete the circle.

(b) *As used by government agencies other public health*

Vital statistics are also utilized extensively in the programmes of governmental agencies other than those concerned with public health.

Birth, death, and marriage rates — both current and projected — as well as data on family size and structure, are essential to intelligent and financially wise planning in the field of public housing. No other indices provide current guides to the size and distribution of population segments necessary for the location of new housing.

Provision of the physical facilities for education, as well as training of teachers, must be co-ordinated with the need expressed in the trend of the birth and marriage rates and their geographic differentials. Public insurance enterprises, as well as social-security systems, are directly dependent on life tables which, in turn, are computed from population and death rates. Unless the basic vital statistics are both reliable and adequate, the computed values will be in error and the systems of insurance unsound financially, or the public itself will suffer through payment of excessive premiums. In addition to the role of the life tables in insurance enterprises, the incidence of widowhood, remarriage, and orphanhood also plays a large part in determining types of insurance coverage.

Provision of food supplies in areas where they are government-controlled or rationed is usually planned in accordance with the probable need as reflected in the birth and death rates. Likewise, in long-range planning for economic development, it may sometimes be necessary to rely on the birth and death rates to provide some idea of the potential supply of labour in various geographic and occupational sectors.

In many of these questions, not only birth and death statistics are involved; statistics of marriage and divorce are also of great importance. In instance after instance, various types of vital statistics have been major factors in initiating programmes in the field of education, housing, welfare, and so forth, or in affecting the course of programmes already underway.

(c) *As used by commercial interests*

Perhaps the most important consumer of vital statistics in the commercial field is the insurance agency. Actuarial science is rooted in vital statistics, and the success or failure of the enterprise may rest on the reliability of the statistics and the estimates made upon them.

The problem of gauging the requirements of the public in terms of consumer goods such as medicine, food, clothing, furniture, etc., is one which depends to a large extent on vital statistics for its solution. If the birth rate remains high over a long period, it may safely be assumed that the demand for maternity clothing will remain high, that medicine, food, clothing, equipment and furniture for infants will remain in demand, that housing and house furnishings will be at a premium. Projecting high birth rates ahead, commercial enterprises may safely plan for enlarged stocks of clothing for growing children, for larger houses, for an increase in the demand for toys and other play equipment, for automobiles, and so forth. Mention may also be made of the market-analysis function of advertising agencies, an analysis in which they employ vital statistics, especially marriage and birth rates.

In addition to its over-all effect on population growth, the current death rate and its geographic distribution is important to the business planning of various commercial interests — from the drug manufacturer and the hospital administrator to the undertaker and the casket maker.

The number of marriages has importance for the building industry, and the trend of the marriage rate influences the business prospects of jewellers and of clothing and furniture manufacturers.

The range of business enterprises which are interested to some extent in vital statistics is very wide. The examples given above are set forth to suggest the extent of the commercial uses which may be found for these products of the vital-statistics system.

C. International uses of vital statistics

The above discussion of the needs and uses of vital records and statistics is largely in terms of the individual and the state or national government. Little if anything has been said with respect to the uses of vital statistics from the international viewpoint — the larger aim which G. H. Knibbs pointed out in the Appendix to the Statistician's Report on the 1911 *Census of the Commonwealth of Australia*.[7] More than forty years ago, Knibbs realized the need for a systematic world-wide study of population statistics when he said:

> "Only by a sufficiently wide survey of human facts can the required *norms* of all sorts be established, norms which represent the characters of the great unit constituted by the aggregation of all the nations. It is only in the comparatively slow secular changes of these norms, that the drift of mankind in the gross can be unequivocally revealed; when that drift is ascertained, the quicker and the more marked variations of individual nations and populations can then be forced to disclose the real significance of their differentiating tendencies."

He went on to set forth the uses he saw for statistics of population, and his statement stands even today as a classic. It reads as follows:

> "In earlier days monarchs utilized statistics as a basis for judging the probability of success in operations of war and plunder. That use has not disappeared, but the plexus of relations, which, through the fructifying power of science, the modern world has seen established, particularly in the realms of industry and commerce, has shewn a growing measure of economic solidarity in the affairs of mankind. The

[6] *Vital Statistics and Public Health Work in the Tropics . . . op. cit.* p. 3.

[7] Vol. I, issued under the Authority of the Minister of State for Home and Territories, Melbourne, 1917. 504 p.

modern world responds to everything that profoundly touches any one nation. By the conditions of modern life mankind tends to be welded into a unit. By the magic of invention, humanity has been quickened; distance — if not annihilated — has been immensely shortened; life has been enriched in the potentialities of material and psychical enjoyment, and be it said also in the plane of its possible intellectual and moral effort. The destiny of mankind will therefore be the supreme problem of those statisticians of the future, who have an adequate outlook on that science and art with which it is their privilege to concern themselves. For the craftsman with acute and microscopic vision there are a multitude of analyses to be made; for one with the capacity for reaching wide generalisations there is no end of larger work, while for him who is happily able to see both the trees *and* the forest of the statistical landscape, there is the most far-reaching task of all, the creation of a statistical world-picture, which shall reveal the secrets of man's place in the many-sided world of social-economics, using that word in its fullest and most ideal sense."

To assist in the creation of the "statistical world-picture, which shall reveal the secrets of man's place in the many-sided world of social-economics," the Statistical Office of the United Nations has been given the task — among others — of assembling and publishing international vital statistics. The accomplishment of this function demands first a large and carefully integrated network of relationships with individual governments in order that statistics, produced on a national basis, may be presented for international study.

Presentation of data takes various forms, but for vital statistics, the most important is the *Demographic Yearbook*. This compendium of national data on population and vital statistics was published first in 1948, and it has continued to be issued each year since that date. The data included are not strictly comparable yet, but their deviations are clearly marked and the tabulations can serve admirably for the "multitude of analyses" that Knibbs foresaw so long ago. They bring to the general public in every country the experience of every other country and provide the basis not only for national "stock-taking" but for international planning in the realm of public health and socio-economic development.

CHAPTER III

GOVERNMENTAL PROVISION — LEGAL AND ADMINISTRATIVE — FOR REGISTRATION OF VITAL EVENTS AND FOR COMPILATION OF VITAL STATISTICS

A knowledge of the laws and the various organizational patterns by which vital events are registered and vital statistics compiled is essential to the understanding of the vital-statistics system. This chapter will be devoted to an analysis of these aspects of the system in some 65 countries of the world. The merits of each type of administrative organization, as well as its disadvantages, will be presented.

A. Registration laws

The foundation of every statistical system is legislation which authorizes a governmental agency to produce statistics and defines the powers and resources which that agency may use to carry out this responsibility. In the case of the vital-statistics system, there is usually such an authorizing law, frequently the general "statistics act", but there is, in addition, the legislation which provides for the registration function itself. The Births and Deaths Registration Acts and The Marriage Act, as they are known in England and Wales, New Zealand, and many parts of the British Commonwealth; the Births, Deaths and Marriages Registration Act of India; The Law on State Registers and the Law on Marriage in Yugoslavia; the registration services based on provisions of the Civil Codes of Continental Europe and of Latin America; and the state or provincial Vital Statistics Acts of the United States and Canada are examples of the legislation under which vital events are registered in the various countries of the world.

Vital-registration legislation, irrespective of the name under which it is enacted, usually designates the events the occurrence of which must be registered; it specifies the time allowed for such registration, the person or informant who is responsible for notifying the registrar, the place where the registration is to be made, and the information to be registered. It may also specify the manner in which the record should be inscribed and how it should be maintained, and the responsibilities or duties of the registrar with respect to each of these functions. The details may differ from country to country, but there are certain elements which are or should be common to this type of legislation wherever it may be enacted. These fundamental elements are the obligatory or compulsory nature of the legislation and the nationwide, "complete" coverage — both geographic and ethnic — which it implies.

1. COMPULSORY NATURE OF REGISTRATION

The compulsion or legal obligation to register a vital event may be accepted as the basic premise of the entire vital-statistics system. When registration is voluntary rather than compulsory, there can be no complete or accurate vital records or statistics.

(a) *International recommendation*

Because the concept that registration should be compulsory is so fundamental, the United Nations has included it as a principle or standard for the development of a vital-statistics system.[1] The Principle is stated as follows:

"203. *Compulsory nature of registration*

"(*a*) In accordance with priorities established under Principle 201, registration of every vital event occurring within the boundaries of the country should be made legally compulsory for every group of the population and parallel provision for enforcement should be established.

"(*b*) Supplementary arrangements on a non-compulsory basis for registration of events among national residents who are temporarily abroad may be provided at the national level.

"(*c*) The efficiency with which these provisions operate or may be presumed to operate should not be a factor in their establishment."

The history of registration confirms the correctness of this principle. In the case of England and Wales, the Births, Marriages, and Deaths Registration Act was promulgated in 1836, but it was not until the Births and Deaths Registration Act of 1874 made registration compulsory and failure to register a punishable offence, that registration became "complete" in terms of relatively prompt and accurate inscription of events.[2]

The Health Survey and Development Committee of India[3] notes in its report dated 1946 that "one of the causes for such incompleteness of registration [in India] is that, over large areas in the country, registration of births and deaths is not compulsory". It goes on to remark that "even in those limited areas where registration is compulsory, the provisions of the Acts are rarely enforced, so that generally speaking, vital statistics are deplorably defective".[3] The Committee recommended

[1] *Principles for a Vital Statistics System; Recommendations for the Improvement and Standardization of Vital Statistics.* United Nations. Statistical Office. Document ST/STAT/SER. M/19, 26 August 1953. p. 7. (Sales No. 1953.XVII.8)

[2] *Official Vital Statistics of England and Wales* by Major Greenwood and P. Granville Edge. League of Nations. Health Organisation. Geneva, 1925. p. 29 (*Statistical Handbooks Series,* 3. Document C.H.270).

[3] *Report of the Health Survey and Development Committee,* Vol. 1, *Survey.* Published by the Manager of Publications, Delhi; printed by the Government of India Press, Calcutta. HC.8.I, 1946. p. 155.

that "registration of vital statistics should be made compulsory".[4]

The "nation-wide" feature of compulsory registration is one of its most important aspects. By virtue of this provision, any vital event occurring within the national boundaries is required to be registered and thus, in theory, national vital statistics are attainable.[5]

The registration law may provide, as it usually does, for nation-wide registration in terms of geography, but there are instances in which the legislation is restrictive in the sense that it excludes certain segments of the population either entirely or in part. Sometimes, registration for the excluded group, perhaps of a somewhat less comprehensive nature, may be provided under a separate regulation. In other cases, registration may be voluntary rather than compulsory for the population not covered by the provisions of the principal Act.

Whatever its origin, except in countries where very primitive conditions prevail, limitation of compulsory registration to only a segment of the population, however large, is not to be recommended. Even when compliance with the registration law varies in quality, there is reason to believe that uniform provision for registration throughout the area is desirable. Within the framework of the uniform registration law, provision can be made, when required, for a simpler type of registration, i.e., for registration documents containing only a minimum number of items of information to be used for registration among peoples of lower levels of literacy, or for the use of non-medical as well as medical certification-of-death forms. Further adjustments required to safeguard the quality of the resulting vital statistics can be made at the statistical collection or tabulation levels, but meanwhile experience in complying with registration requirements could be accumulated.

It should be emphasized, however, that the establishment of legislation governing registration — either national in the case of centralized government or subnational in federal unions — does not mean necessarily that methods for implementing the law have also been set up. Nor does it imply that the system of registration functions well or indeed at all. Finally, it does not mean that statistical reports on the registered events are necessarily being sent to the statistical authorities regularly and completely.[6] The passage of the registration legislation, fundamental as it is, provides only the authorization and the obligation to register certain vital events wherever they may occur. However, it is the first and basic step in establishing a vital-statistics system.

(b) *National practice*

Very few countries have failed to enact basic laws requiring compulsory registration of at least births, deaths, and marriages, as will be seen in table 1 which presents the dates when such compulsory national civil registration was established in 65 countries.

[4] *Report of the Health Survey and Development Committee*, Vol. IV, *Summary*. Published by the Manager of Publications, Delhi; printed by the Government of India Press, New Delhi. HC.8.IV, 1946. p. 59.

[5] "Nation-wide", as used here, refers especially to a centralized administration for vital registration in which the registration law, like any other national legislation, covers the entire geographic territory of the political unit. Attention should also be called to those countries of a federated type (United States, Canada, Argentina, Australia) where vital registration and statistics are governed not by national but by subnational laws. In these areas, there will be as many laws as there are autonomous subnational units and, in such cases, complete geographic coverage cannot be achieved until each individual federated political unit establishes the necessary legislation.

[6] See also chapter VIII.

Table 1. Date of Compulsory National Civil Registration Law Governing Registration of Live Births, Deaths, Stillbirths, Marriages, and Divorces: 65 Countries, as of 1 January 1950

(In general, data refer to effective date of the decree establishing obligation to register with authorities responsible for maintaining civil registers of vital events. Three dots ". . ." indicate that no information is available.)

Continent and country	*Live birth*	*Death*	*Stillbirth*	*Marriage*	*Divorce*
AFRICA					
Egypt	1839	1839	1912	(1)	(1)
Union of South Africa[2]	1924	1924	1924	1924	(1)
AMERICA, NORTH					
Canada	(3)	(3)	(3)	(3)	(4)
Costa Rica	1888	1888	1888	1888	1888
Cuba	1885	1885	1885	1885	1885[5]
Dominican Republic	1884	1884	1884	1884	1884
El Salvador	1879	1879	(6)	1879	1879
Guatemala	1877	1877	1877	1877	1877
Haiti	1922	1922	1922	1922	1922
Honduras	1882	1882	(6)	1882	1882
Mexico	1859	1859	1859	1859	1859
Nicaragua	1879	1879	1879	1879	1879
Panama	1914	1914	1914	1914	1914[5]
United States	(7)	(7)	(7)	(8)	(8)

(Continued on following page)

Table 1. Date of Compulsory National Civil Registration Law Governing Registration of Live Births, Deaths, Stillbirths, Marriages, and Divorces: 65 Countries, as of 1 January 1950—*(Continued)*

Continent and country	*Live birth*	*Death*	*Stillbirth*	*Marriage*	*Divorce*
AMERICA, SOUTH					
Argentina	(9)	(9)	(9)	(9)	(10)
Bolivia	1940	1940	1940	1911	1932[5]
Brazil	1889[11]	1889	1889	1889	(10)
Chile	1885	1885	1885	1885	(10)
Colombia	1938	1938	(6)	1938	(10)
Ecuador	1901	1901	1901	1901	1901
Paraguay	1914	1914	1946	1898	(10)
Peru	1852	1852	(6)	1852	1852[5]
Uruguay	1879	1879	1879	1879	1879
Venezuela	1863	1863	1863	1863	1863[5]
ASIA					
Burma	(12)	(12)	(12)	(13)	(1)
Ceylon	1897	1897	1897[14]	(15)	(15)
India	(16)	(16)	(16)	(17)	(17)
Indonesia	(18)	(18)	(18)	(18)	(18)
Iran	(19)	(19)	...	(19)	(19)
Israel	1920	1920	1920	(1)	(1)
Japan	1898	1898	1946	1898	1898
Jordan	1926	1926	(6)	(1)	(1)
Lebanon	1925	1925	(6)	1925	1925
Pakistan	(20)	(20)	(20)	(21)	(21)
Philippines	1931	1931	1931	1931	(10)
Syria	1914	1914	(6)	1914	1914
Thailand	1916	1916	1916	1935	1935
Turkey	1914	1914	(6)	1914	(1)
EUROPE					
Austria	1784	1784	1784	1784	1885[5]
Belgium	1796	1796	1796	1796	1796[5]
Czechoslovakia	1784	1784	1784	1784	(1)
Denmark	1646	1646	1646	1646	(1)
Finland	1628	1628	1628	1628	1890
France	1792	1792	1792	1792	1792[5]
German Federal Republic	1876	1876	1876	1876	(1)
Greece	1925	1925	1925	1925	1925[5]
Iceland	1735	1735	(22)	(22)	(1)
Ireland	1864	1864	(6)	1864	(10)
Italy	1865	1865	1865	1865	(10)
Liechtenstein	1926	1926	1926	1926	1926[5]
Luxembourg	1803	1803	1803	1803	1703
Monaco	1793	1793	1793	1793	1893
Netherlands	1811	1811	1811	1811	1811[5]
Norway	1685	1685	1685	1685	(1)
Poland[23]	1946	1946	1946	1946	1946[5]
Portugal	1911	1911	1911	1911	1911[5]
Spain	1871	1871	1871	1871	(10)
Sweden	1686	1686	1686	1686	1686
Switzerland	1876	1876	1876	1876	1876[5]
United Kingdom:					
England and Wales	1875[24]	1875[24]	1927	1875[25]	(1)
Northern Ireland	1864	1864	(6)	1864[26]	(1)
Scotland	1855	1855	1939	1855	(1)
Yugoslavia	1946	1946	1946	1946	(1)
OCEANIA					
Australia	(27)	(27)	(27)	(27)	(1)
New Zealand[28]	1855	1855	1913	1855	(1)

(Continued on following page)

(Footnotes to Table 1)

[1] Registered only as part of the records of the religious or judicial authorities concerned, and statistics are based on these records. There is no further compulsory registration in the civil-registry system.

[2] Until 1924, a different series of laws relating to the registration of births and deaths was in force in each of the provinces, the dates of which are as follows:

	Births and deaths	*Marriages*
Cape Province	1895	1812
Transvaal	1901	1869
Orange Free State	1902	1872
Natal	1868	1880

In 1923, the Births, Deaths and Marriage Registration Act, consolidating and amending the laws in force in the various provinces, was passed and brought into action as from 1 January 1924. Registration is compulsory for all races in the urban areas. In rural areas, natives may register voluntarily; for all other races, registration is compulsory.

[3] The registration system is a provincial responsibility administered under Provincial Acts. Registration Acts were adopted in the provinces and territories as of the following dates:

Quebec	1678
Nova Scotia	1761
Ontario	1869
British Columbia	1872
Manitoba	1873
New Brunswick	1887
Northwest Territories	1888
Yukon Territory	1898
Prince Edward Island	1906
Alberta	1907
Saskatchewan	1916

For the province of Quebec, a civil registration act was adopted in 1925. The British Colony of Newfoundland entered the Confederation of Canadian Provinces on 1 April 1949.

[4] No information is available as to the year when the registration or returns of divorce became compulsory in the several provinces. In most provinces with the exception of Quebec (where divorces are granted through the Parliament of Canada), divorce records are transmitted by the clerk of the provincial civil courts to the registrar of vital statistics of the province where the divorce is granted for such registration as is provided by the law of the province. In British Columbia, for example, the Vital Statistics Act provides that "Every District Registrar of the Supreme Court shall at the end of each month transmit to the Registrar of Births, Deaths and Marriages a certified copy of each final decree of dissolution of marriage or of nullity of marriage entered in his registry during that month, and the Registrar of Births, Deaths, and Marriages shall register the same in his office."

[5] In addition to court registration, divorces are also registered in the civil register on the margin of the original registration record of marriage.

[6] Civil registration of stillbirths is not compulsory, but in Honduras, El Salvador, Syria, Turkey, Colombia, and Peru, statistics of such stillbirths as are reported are obtained from other sources such as burial permits or entries in the register of deaths or births.

[7] Within the United States of America, the authority for vital statistics law has generally been considered a part of the police power, and as such solely within the province of the various state governments. Historically, while vital registration law in the United States dates back to 1632 (registration law enacted in Virginia Colony), because of the weakness of many laws, the incompleteness of registration, and the variations found in forms and definitions, the modern law can be said to date from 1900. The exact dates when enactment of first state registration laws took place are given below. Stillbirths were originally registered as both a birth and a death.

State	*Births*	*Deaths*
Alabama	1881	1881
Arizona	1909	1909
Arkansas	1881	1881
California	1877	1858
Colorado	1876	1876
Connecticut	1852	1852
Delaware	1861	1861
District of Columbia	1854	1853
Florida	1899	1899
Georgia	1823	1875
Idaho	1907	1907
Illinois	1877	1877
Indiana	1907	1881
Iowa	1880	1880
Kansas	1911	1911
Kentucky	1851	1851
Louisiana	1811	1811
Maine	1821	1821
Maryland	1880	1880
Massachusetts	1840	1840
Michigan	1867	1867
Minnesota	1870	1870
Mississippi	1878	1878
Missouri	1891	1891
Montana	1895	1895
Nebraska	1905	1905
Nevada	1911	1911
New Hampshire	1849	1849
New Jersey	1848	1848
New Mexico	1907	1907
New York	1847	1847
North Carolina	1877	1877
North Dakota	1899	1899
Ohio	1867	1867
Oklahoma	1907	1907
Oregon	1903	1903
Pennsylvania	1851	1851
Rhode Island	1850	1850
South Carolina	1878	1878
South Dakota	1905	1905
Tennessee	1881	1881
Texas	1873	1873
Utah	1898	1898
Vermont	1856	1856
Virginia	1853	1853
Washington	1891	1891
West Virginia	1866	1866
Wisconsin	1852	1852
Wyoming	1907	1907

[8] Registration of marriage and divorce is less systematized than that of birth and death, and marriage, divorce, and annulment records generally are not handled by local registrars of vital statistics. In most states, marriage licences are issued by clerks of county or city courts. Person performing marriage must register event with official who issued licence. In approximately three-fourths of the states, there is also some provision for the local licensing official to send the original, a copy, or a partial transcript of the marriage registration record to the State Registrar of Vital Statistics.

Divorces are registered locally as part of the records of the courts concerned. In approximately half of the states, there is now also some provision for filing a certified copy or transcript with the State Registrar. The dates when the first state registration laws were enacted are given below:

State	*Marriages*	*Divorces*
Alabama	1810	1873
Arizona	1864	1871
Arkansas	1901	1923
California	1846	1846
Colorado	1860	1861
Connecticut	1848	1860
Delaware	1913	1897
District of Columbia	1811	1800
Florida	1821	1831
Georgia	1786	1830
Idaho	1864	1862
Illinois	1809	?
Indiana	?	?

(Continued on following page)

(Footnotes to Table 1—Continued)

Iowa	1832	1856
Kansas	1867	1857
Kentucky	?	?
Louisiana	1807	1809
Maine	?	?
Maryland	1777	1777
Massachusetts	1639	?
Michigan	1867	1897
Minnesota	1847	1849
Mississippi	1820	1809
Missouri	1805	1819
Montana	1865	1872
Nebraska	1855	1855
Nevada	1855	1862
New Hampshire	1677	1850
New Jersey	1848	1795
New Mexico	1863	?
New York	1847	?
North Carolina	1712	1828
North Dakota	1872	1874
Ohio	?	?
Oklahoma	1889	?
Oregon	1849	1844
Pennsylvania	1885	1815
Rhode Island	1607	1905
South Carolina	1911	1872
South Dakota	1862	1866
Tennessee	1787	1810
Texas	1834	1839
Utah	1887	1887
Vermont	1765	1861
Virginia	1853	1853
Washington	1854	1849
West Virginia	1772	?
Wisconsin	1820	1848
Wyoming	1868	1868

[9] The Civil Register is a provincial responsibility and laws governing it were adopted at different times, as follows:

Capital and National Territories	1884
Mendoza	1885
Buenos Aires	1888
Santiago del Estero	1889
Jujuy	1889
Salta	1889
Tucumán	1890
San Juan	1893
Córdoba	1895
Catamarca	1895
La Rioja	1897
Santa Fé	1898
San Luis	1898
Corrientes	1900
Entre Ríos	1904

[10] According to national law in 1950, divorce in the sense used here (see chapter IV) did not exist. On 14 December 1954, divorce became legal in Argentina.

[11] Registration is not compulsory for aboriginal Indians born in Brazilian territory if they do not live in a settled community.

[12] Voluntary registration of births and deaths was initiated under the Births, Deaths and Marriages Registration Act of 1886 which came into force in 1888. The legal basis for *compulsory* registration comprises the following:

(*a*) Rangoon Town: Corporation bye-laws;

(*b*) Towns with municipal status: Municipal Act of 1898 and bye-laws;

(*c*) Towns without municipal status: Town Act of 1907;

(*d*) Villages: Village Act of 1907.

[13] Registration of marriage is compulsory by the officiant in the place of marriage under same regulations as birth and death, but there are no prescribed forms. Marriages arranged by parents or by mutual consent are also legal under Burmese Buddhist law, and they are not registered.

[14] Compulsory only in 53 urban "proclaimed areas" where registrar is medical practitioner.

[15] Registration of marriage and divorce became compulsory in 1871 for *Kandyans* (up-country Sinhalese) and in 1937 for *Muslims*. Registration of marriage among the *General* population is not compulsory, but in fact about 90% of their marriages are registered. Divorces respecting General marriages are granted and registered by the district courts, and there is no further registration. Divorces among Kandyans are granted and registered by government agents; Moslem divorces by "Kathi".

[16] There is no uniform legislation for the registration of births and deaths (or stillbirths) applicable to the whole of India, except the Births, Deaths, and Marriages Registration Act of 1886 which, however, provides only for voluntary registration. Registration is compulsory practically throughout all of the states which correspond to the former Governors' Provinces (Part A states) but generally for urban areas only. Some states like Bengal (1873), Assam (1935), Cochin, Hyderabad, Madhya Pradesh, Uttar Pradesh, Madras (1899), Mysore (1918), and Coorg (1932) have passed special Acts of their own. The operation of these acts is not necessarily limited to the present boundaries of the states after which the Acts are named. They continue to apply in areas which have since been separated to form parts of other states. For instance, the Bengal Births and Deaths Registration Act of 1873, by which registration was made compulsory in municipal areas, applies also to Bihar and North Orissa; and the Madras Registration of Births and Deaths Act, 1899, by which registration became compulsory in rural tracts, also applies to Southern Orissa which previously fell within Madras. Other states have framed rules under the appropriate provincial or municipal acts for municipal towns and under police or revenue acts for other areas.

[17] Prior to the introduction of the new Hindu Code Bill (1955), divorce among the Hindu and Moslem population (90% of total) was allowed only under caste and tribal law, and marriage was governed by ecclesiastical law. Therefore, in 1950, there existed no national system of compulsory civil registration of marriage or divorce among Hindus and Moslems, who constitute the bulk of the population. The compulsory acts apply only to Christians and to other small segments of the population.

[18] Civil registration of live births, deaths, stillbirths, marriages, and divorces is not compulsory for the Indonesian population, but only for "Europeans" and Chinese, who constitute about 10% of the population. Marriages and divorces of Moslems are registered at the mosques.

[19] Registration is compulsory, but date of establishment is unknown.

[20] Compulsory only in urban areas under the Municipal Acts and bye-laws framed thereunder. Pakistan has adopted the Births, Deaths, and Marriages Registration Act of 1886 which came into force in India in 1888 but which, on a national basis, provides only for voluntary registration. See also footnote 16.

[21] There exists no national system of compulsory civil registration of marriage or divorce among Moslems who constitute the bulk of the population. See also footnote 17.

[22] Dates unknown. Data on stillbirths available since 1786; on marriages since 1768.

[23] In some parts of the country, registration compulsory since 1874. For the whole of Poland, registration has been compulsory only since 1946.

[24] Civil registration was introduced in 1837, but it was not until 1875 that registration became a statutory duty imposed on the informant.

[25] Marriages according to the rites and ceremonies of the Church of England have been registrable since 1538.

[26] In Roman Catholic churches, 1864; in others, 1845.

[27] In Australia, each state and territory is responsible for its own system of registration. Dates when registration became compulsory in each state for births, deaths, stillbirths, and marriages are as follows:

(Continued at foot of following page)

It should be noted that these dates refer to the time when the nation-wide obligation to register live births, deaths, foetal deaths, marriages, and divorces under penalty of law became a part of the national civil legislation. These same events may have been registrable at a much earlier date under voluntary or semi-obligatory arrangements, as they were, for example, in England and Wales beginning in 1837. They may have been registered by ecclesiastical authorities in the absence of civil legislation, as they were in Bolivia before 1940, in Colombia prior to 1939, and in Germany prior to 1876. Or, prior to the date given in table 1, registration may have been compulsory for only part of the national territory, as exemplified by Yugoslavia and Poland before 1946, and by India and Pakistan even today.

Chronological history. In order to recapitulate the evolution of compulsory registration among the sovereign areas of the world, the countries in table 1 have been classified by the date of the establishment, on a national basis and for all groups of the population, of compulsory legislation for live-birth and death registration. The following is the distribution of the 65 countries according to this classification scheme:

Time period	*Number of countries reporting installation of compulsory registration during the period*
1625-1649	2
1650-1674	0
1675-1699	2
1700-1724	0
1725-1749	1
1750-1774	0
1775-1799	5
1800-1824	2
1825-1849	1
1850-1874	9
1875-1899	14
1900-1924	8
1925-1949	9
Different date for constituent political units	5
Unknown	2
No compulsory legislation covering all national territory or population	5
ALL COUNTRIES	65

It will be seen from this tabulation that during the 100 years from 1850 to 1949 inclusive, 40 countries, or three quarters of the 53 countries reporting one national law, established a compulsory system of registration. Among this group of nations will be found the countries of Asia and most of those in Latin America, many of whom passed civil registration laws during the last quarter of the 19th century. Only 13 countries established compulsory registration prior to 1850. These were the countries of Europe where registration began and persisted as an ecclesiastical function and those which were influenced strongly by the Napoleonic Code.

Among the four countries in which vital registration is *not* a federal or national responsibility but one under state or provincial jurisdiction, that is, in Canada, the United States, Argentina and Australia, the history is roughly analogous. During the period 1850-1949, all the 15 provinces of Argentina, 42 of the 48 states of the United States of America, eight of the 10 provinces of Canada, and four of the eight states and territories of Australia established compulsory registration of births and deaths, the remaining civil divisions of the latter three countries having passed compulsory legislation prior to 1850. Burma's compulsory laws — one type for urban and another for rural areas — were passed in 1898 and 1907 respectively. Thus, it will be seen that compulsory registration is largely a development of the last 100 years, or more exactly of the 75 years ending in 1949.

The analysis presented above refers primarily to the dates when compulsory registration of live births and deaths was established. In general, however, compulsory registration was initiated at the same time for live births, deaths, stillbirths, marriages and divorces. The major exceptions to this generality are in divorce registration because, as will be seen from tables 1 and 2, many countries entrust divorce registration solely to the officiating courts rather than to the civil registry, thus excluding these events from civil registration legislation.

Stillbirth registration is of more recent origin than that for live births and deaths in six countries. In Paraguay and Japan, for example, it was not until 1946 that stillbirths became legally registrable; in Scotland, it was 1939; in England and Wales, 1927; in New Zealand, 1913; and in Egypt, 1912.

Information for certain countries which exclude stillbirths from the civil register (see p. 25) reveals that the exclusion is based on the fact that under civil law a stillbirth, never having lived, has no rights as a "citizen" and, therefore, need not be registered. The same philosophy may have been one factor accounting for the delay in establishing compulsory stillbirth registration in Scotland, England and Wales, New Zealand, Paraguay, Japan and Egypt.

Coverage. As indicators of the era when registration of vital events became compulsory in the various countries of the world, the dates in table 1 are of historical interest, but more important, they serve as a guide to the events covered by the registration law in each country and, thus, to some extent as an indication of the statistics which might be available.

Table 1 shows that the registration of live births and deaths is compulsory on a nation-wide basis for all the population in all the countries shown, with the exception of Brazil, India, Indonesia, Pakistan, and the Union of South Africa. In India and Pakistan, the only *national* provision which exists is for voluntary registration of births and deaths. Obligatory laws governing birth and death registration have been enacted by certain states and municipalities in both countries (see notes to table 1), but their functioning leaves much to be de-

(Footnotes to Table 1—Concluded)

	Births	*Deaths*	*Stillbirths*	*Marriages*
New South Wales ...	1856	1856	1935	1856
Victoria	1853	1853	1953	1853
Queensland	1856	1856	Voluntary	1856
South Australia	1842	1842	1937	1842
Western Australia ..	1841	1841	1907	1841
Tasmania	1838	1838	Not compulsory	1838
Australian Capital Territory	1856	1856	1930	1856
Northern Territory ..	1842	1842	Compulsory; date unknown	1842

[28] Registration of Maori births and deaths is governed by Regulations of 1935. Registration of Maori marriages was not compulsory in 1950, although they became subject to ordinary laws affecting European marriages as of 1 April 1952.

sired. Registration in rural areas is still largely voluntary.

Compulsory registration in Indonesia covers only the Europeans, the Chinese, and a very few Indonesians of certain class or income, the whole group accounting for only about 10 per cent of the total population of Indonesia. Consideration, however, is now being given to drafting laws for nation-wide compulsory registration of births, deaths, and stillbirths, and also civil registration of marriages and divorces.

Compulsory registration in the Union of South Africa was limited in 1950 to White, Coloured and Asiatic population, and to Natives living in urban areas. Beginning 1 July 1952, the obligation to register was extended to the Natives living in rural areas also. In Brazil, aborigines born in Brazilian territory but living outside the populated or settled centres, are not covered by the law.

In 1950, stillbirths did not come under the compulsory registration act in El Salvador, Honduras, Colombia, Peru, Lebanon, Jordan, Syria, Turkey, Ireland, Northern Ireland, and the three Australian states of Victoria,[7] Queensland and Tasmania. In addition, nation-wide compulsory registration of stillbirths does not exist in India, Indonesia, Pakistan, Union of South Africa, and Ceylon. Like births and deaths, stillbirths requiring registration in the Union of South Africa are those occurring in urban areas and among "European" population in rural parts of the country; in India, Pakistan, and Indonesia, vital registration in general is not compulsory on a nation-wide basis. Ceylon's situation is somewhat different from these in that the limitations of compulsory registration of stillbirths to "Proclaimed Areas" or certain defined reporting areas is in the interest of improving the available data.

It should be emphasized, however, that failure to provide for legal registration of stillbirths, as is the case in the 10 countries named above, does not necessarily mean that statistics of stillbirths are entirely unavailable for some of these countries. In Colombia, Peru, and Honduras, for example, "stillbirths" are defined (see annex 3) and provision is made to collect statistics from the burial permits; in El Salvador, though registration is not provided in the law, many stillbirths are registered and statistics are compiled; India also compiles statistics on those stillbirths which are reported from areas where registration is compulsory. Ceylon's statistics are limited, naturally, to the "reporting areas" for which data are considered accurate and reporting complete.

In all but six of the 65 countries for which data are shown in table 1, marriages must be registered with a designated authority. The six exceptions include India, which recognizes only sacramental marriage[8] and where, therefore, there is no compulsion to register marriages, except those among the minor segment (6 per cent) of the population consisting of Christians and Parsees. Pakistan, similar to India, has no compulsory provision for marriage registration among Moslems. Indonesia has no compulsory civil registration except for Europeans and Chinese, who constitute about 10 per cent of the population; marriages of Moslems are, of course, registered at the mosques. Burma has no legal provision for marriage registration on a nation-wide basis, except in so far as the officiant is responsible; marriages of the "customary" type which are arranged by the parents or by mutual consent and which are sanctioned by Burmese Buddhist law are not registered.

In the Union of South Africa, marriages — like births and deaths — are obliged to be registered by the European population wherever they live and by natives in urban areas. In Ceylon, marriage registration is compulsory for Moslem and Kandyan, but not for the "General" population. It should be noted, however, that almost all marriages among the "General" population are registered despite the voluntary character of the provision.

In nine countries of the world, divorce in the sense of dissolution of marriage and the consequent conferring of the right to remarry (see chapter IV) does not exist. Thus, in Argentina, Brazil, Chile, Colombia, Paraguay, Philippines, Ireland, Italy and Spain, there was no divorce in 1950 and, hence, no current statistics on the subject. It should be noted, however, that on 14 December 1954, divorce became legal in Argentina. Whether it is subject to civil registration is not known.

Civil registration of divorce is not compulsory for the bulk of the population in India, Indonesia, Pakistan, and the Union of South Africa. In India, divorce has been allowed under caste and tribal laws but, except for Christians and Parsees, has not been recognized under Hindu civil law. Pakistan has as yet no compulsory registration provisions. In Indonesia, divorces of Moslems are registered in the courts, but civil registration is compulsory only for Christians and Chinese. Divorces of natives in rural areas are not registrable in the Union of South Africa. In the remaining 53 countries, and for such registration as is compulsory among the four mentioned above, divorces are subject to registration by some governmental authority. In 18 of these, this "authority" is the court concerned; there is no further civil registration in these cases.

2. Penalty for non-compliance

Very closely linked with compulsion to register is the idea of imposing a penalty for failure to comply with the registration obligation. If registration is compulsory under law, then failure to register should be punishable by law. In connexion with registration in the United States, this has been clearly stated in the following words:[9]

> "A law without a penalty to be enforced in case of its violation is worthless, and many good laws have become useless in practice because of the neglect of the authorities to enforce such penalties. *Reasonable penalties should be provided and it should be made the duty of the state and local registrars, under penalty, to enforce them.* The registration of births and deaths is a duty to the state and to the citizens thereof,

[7] Stillbirth registration became compulsory in 1953.

[8] The Hindu Code Bill (1951) would alter the marriage, divorce, and inheritance legislation of India so that civil marriage and divorce would be recognized by law. The Bill became law 19 May 1955.

[9] "Why Should Births and Deaths be Registered?" *Measures Relating to Vital Records and Vital Statistics: Message from The President of the United States Transmitting Report of the Bureau of the Budget.* House Document No. 242, 78th Congress, 1st Session. Gov. Print. Off., Washington, 1943. p. 137-160.

and it should not be made the sport of politics or favoritism."

The sentiment expressed above can be found in most of the registration laws or civil codes in existence. Information is available for only 36 countries out of the 65 shown in table 1, and in each of these the registration law provides a penalty for failure to comply.

(a) *Need for enforcement*

In spite of the legal provision, however, there is abundant evidence of reluctance or perhaps inability on the part of some authorities to enforce this legislation. Such evidence is found not only in the acknowledged under-registration of vital events but also in the vital-statistics history of certain countries. For example, it is reported that in the United States — where fines up to $100, or imprisonment, or both are authorized for violations — during one three-year period, only eight states prosecuted one or more physicians for failure to register births or deaths, and 11 states prosecuted funeral directors for not filing death certificates. In view of the under-registration admitted in those states for the same period, this would seem to be a small number of prosecutions. As noted in the source to which reference is made,[10] "Local registrars generally find it difficult or inexpedient to antagonize either group [physicians or funeral directors] by vigorous action against those who are delinquent in reporting". Yet, the report goes on to say that the states in which birth and death registration have proved most complete and accurate are those in which the state health departments have a firm policy of enforcement.

In countries in which the parent is responsible for registration of births and the relatives for death registration (see chapter V, section B), the problem of prosecution for failure to comply with the law has the advantage of not involving, and perhaps antagonizing, organized groups such as those in the medical profession. If a parent in Canada, for example, persists in his delinquency with respect to registering a birth, he may be prosecuted. But such prosecutions are instituted for their potential educational value and not for punitive reasons. The co-operation of the press in publicizing such prosecutions has been found of great assistance in creating an awareness of public responsibility in the matter of registration.

The potential educational value of prosecution for delinquency in registration was recognized also by the Health Survey and Development Committee,[11] which made certain recommendations for improvement of vital statistics in India. The Committee noted that the Central Advisory Board of Health in 1939 had discussed a *Memorandum on India Vital Statistics* which included a statement to the following effect:

> "There is little doubt that the more general introduction of compulsory registration would have considerable effect in this direction (improvement of vital statistics). Moreover, even in those areas in which registration is compulsory, little or no notice is taken of breaches of the law and a few judiciously selected prosecutions would have a salutary educational effect."

The Committee went on to say that the position remained unchanged and that they considered "that the enforcement of the law through the prosecution of offenders is essential if definite improvement is to be secured".

It is recognized that the principle of penalizing failure to comply with registration laws may well not be invoked in all instances, inasmuch as in order to invoke it, knowledge must be had that an event has actually occurred, that registration of this event was wilfully neglected, and that continued delinquency is to be expected; these conditions are difficult to establish legally. However, the legal basis for prosecution must exist if general compliance with the law is to be obtained.

B. Administrative organization for registration

With the enactment of a law comes the necessity for establishing an organization to carry out the purposes of the legislation. Registration laws are no exception. A description of the types of organizations which have been established to register vital events — the administrative machinery set up to accomplish registration — will be the subject of this section of the *Handbook*.

1. Types of organization — centralized and decentralized control

The raw data for vital statistics, that is, the vital records, are collected through nation-wide networks of local register offices. It was pointed out in chapter I that the registration of vital events had its beginning in the ecclesiastical parishes. The primary registration unit was the parish church, and the registrar was the pastor or priest. As the parochial registers were replaced with civil registers on a nation-wide basis, there arose the parallel problem of re-defining the basic registration units and their relation to the national government. On the assumption that the ecclesiastical areas were not suitable,[12] there remained a choice between adopting for this purpose the regular geographic and administrative sub-divisions, and the setting up of still another network of areas designed purely for registration purposes. In some cases, the sanitary districts became the registration units; in others, the parishes; in still others, the civil administrative sub-divisions themselves were employed; but, in general, the registration units were designed to cover the entire national territory and, in most cases, they were at least reconcilable with the existing administrative boundaries such as communes, towns, townships or districts.[13]

[10] *Measures Relating to Vital Records and Vital Statistics, op. cit.* p. 61.

[11] *Report of the Health Survey and Development Committee,* Vol. II, *Recommendations.* Published by the Manager of Publications, Delhi; printed by the Government of India Press, New Delhi. HC.8.II, 1946. p. 279.

[12] They have survived in Scandinavian countries and in the Province of Quebec in Canada.

[13] The loss in usefulness when statistical series which are related by subject matter refer to different and non-reconcilable units of area is obvious. The greater the degree of co-extensiveness, the broader the application of the resulting statistics, other factors being equal. It is interesting in this connexion to observe the multiplicity of areas prevalent in England and Wales at the time of the 1901 Census. Reginald Dudfield in his article "A Critical Examination of the Methods of Recording and Publishing Statistical Data Bearing on Public Health; with Suggestions for the Improvement of Such Methods" (*Journal of the Royal Statistical Society,* Vol. LXVIII, Part I, March 1905, p. 7) notes that the following units were listed in the General Report of the Census of 1901:

(*Continued on following page*)

In order to create a "network" of registration offices, it is obvious that the primary units — whatever their basis — would have to be related in some way. One method of connecting them would be through a central registration office to which the primary units would be directly responsible. In the absence of such a central office, the individual local registration offices would be bound together only by their relationship to such central control as may exist for the general affairs of civil or religious administrative sub-divisions. Thus, for purposes of civil registration, these local offices might be completely decentralized with respect to the direct control of the national government and, therefore, essentially "autonomous" for this function, or they may be part of a system of registration units controlled centrally at the provincial or national level.

(*Continued from preceding page*)

No. of units	*Name*
54	Ancient counties
468	Parliamentary areas
2	Ecclesiastical provinces
35	Ecclesiastical dioceses (Inc. Sodor and Man)
14 080	Ecclesiastical parishes
63	Administrative counties (Inc. Isles of Scilly)
67	County boroughs
734	Petty sessional divisions
54	County court circuits
500	County court districts
28	Metropolitan boroughs with their wards
1 122	Urban districts (Including 316 county or municipal boroughs) with their wards
664	Rural districts
14 900	Civil parishes
11	Registration divisions
55	Registration counties
635	Registration districts
2 064	Registration subdistricts

(a) *National practice in 65 countries*

As a means of studying the various types of national organization for registration which are actually in existence, the names of the official governmental agencies charged with the registration of births, deaths, stillbirths, marriages, and divorces at the local and national levels in 65 countries are set forth in table 2, together with the identity of the authority whose duty it is to collect statistical reports on vital events and to compile national vital statistics from them.

The information in the table refers, as indicated in the title, to the situation as it existed on 1 January 1950. However, in recognition of the fact that organization is never static, such administrative changes as are known to the Statistical Office of the United Nations to have occurred up until January 1955 have been incorporated in footnotes to the table. Thus, the table, together with explanatory footnotes reflects the situation in so far as it is known to the Statistical Office as of January 1955.

It should also be emphasized that table 2 reflects the national registration aspect from an operational viewpoint in that it shows a central office only if that office is reported as directly concerned with the registration function and in a position to supervise the individual registration units. Ministerial dependency which is of a general administrative type is not shown, nor does the table include the type of central control exercised by the central statistical authorities in respect of the statistical aspect.

Further, table 2 presents the statistical aspect at the national level only. Intermediary agencies, local or regional, which might also collect and compile vital statistics at a subnational level are not included.

Table 2. Agency of Government Reported To Be Responsible for Civil Registration Function at Local and National Levels and for Compilation of National Statistics on Live Births, Deaths, Stillbirths, Marriages, and Divorces: 65 Countries, as of 1 January 1950

(Title of agency is latest available. Original language is maintained when readily comprehensible to English-language reader; in other cases, English translation is substituted. Ministerial dependency is indicated in parentheses when known.)

Continent and country	*Registration*		*Statistics*
	Agency responsible at subnational (local) level	*Agency directly responsible at national level*	*Agencies responsible at national level*
AFRICA			
Egypt	Health Bureau [urban][1] Tax Collector's Office Land Mayor's Office [rural][1]	None	Statistical Department (Ministry of Finance and Economy)
Union of South Africa	Office of District Registrar[2]	Registrar-General's Office[2]	Bureau of Census and Statistics
AMERICA, NORTH			
Canada	Department of Public Health [Provincial][3]	None	Dominion Bureau of Statistics (Department of Trade and Commerce)
Costa Rica	Oficina del Registrador Auxiliar del Registro Civil	Registro Central del Estado Civil (Ministerio de Gobernación)	Dirección General de Estadística y Censos (Ministerio de Economía y Hacienda)
Cuba	Oficina de Registro Civil [Juzgado municipal]	Dirección de los Registros y del Notariado (Ministerio de Justicia)	Dirección General de Estadística[4] (Ministerio de Hacienda) Oficina Nacional de los Censos Demográfico y Electoral[4] (Tribunal Superior Electoral) Dirección General de Salubridad[5] (Ministerio de Salubridad y Asistencia Social)

(*Continued on following page*)

Table 2. Agency of Government Reported To Be Responsible for Civil Registration Function at Local and National Levels and for Compilation of National Statistics on Live Births, Deaths, Stillbirths, Marriages, and Divorces: 65 Countries, as of 1 January 1950—*(Continued)*

Continent and country	Registration		Statistics
	Agency responsible at subnational (local) level	Agency directly responsible at national level	Agencies responsible at national level
Dominican Republic	Oficina de Estado Civil	Oficina Central de Estado Civil (Procuraduría General de la República)	Dirección General de Estadística (Secretaría de Estado de Economía y Comercio)
El Salvador[6]	Oficina del Registro Civil [Municipal]	None	Dirección General de Estadística y Censos (Ministerio de Economía)
Guatemala	Oficina de Registro Civil [Municipal]	None	Dirección General de Estadística (Ministerio de Economía y Trabajo) Departamento de Estadística[7] (Ministerio de Salud Pública y Asistencia Social)
Haiti	Office de l'état civil[8]	None	Direction générale de la santé publique[9] (Service de la santé publique) Institut haïtien de statistique[4] (Secrétairerie d'Etat de l'economie nationale)
Honduras[6]	Oficina del Registro Civil [Municipal]	None	Dirección General de Censos y Estadísticas (Secretaría de Gobernación)
Mexico	Oficina del Registro Civil	None	Dirección General de Estadística (Secretaría de la Economía Nacional)
Nicaragua	Oficina del Registro del Estado Civil [Municipal]	None	Dirección General de Estadística (Ministerio de Economía)
Panama	Oficina del Registro Auxiliar del Estado Civil	Registro Civil (Ministerio del Gobierno y Justicia)	Registro Civil[10] (Ministerio del Gobierno y Justicia) Departamento de Salud Pública[10] (Ministerio de Trabajo, Previsión Social y Salud Pública)
United States	Department of Health [State][11]	None	Public Health Service (Department of Health, Education, and Welfare)
AMERICA, SOUTH			
Argentina[12]	Registro Civil [Provincial]	None	Dirección Nacional del Servicio Estadístico (Ministerio de Asuntos Técnicos)
Bolivia	Oficialía del Registro Civil	Dirección General del Registro Civil (Ministerio de Gobierno, Justicia y Migración)	Dirección General de Estadística y Censos (Ministerio de Hacienda y Estadística)
Brazil[12]	Office of Civil Register Notary	None	Serviço de Estatística Demográfica, Moral e Política (Ministério da Justiça e Negócios Interiores) Serviço Federal de Bioestatística[13] (Ministério da Saúde Pública)
Chile[12]	Oficina del Registro Civil [Circunscripción]	Servicio Nacional de Registro Civil e Identificación (Ministerio de Justicia)	Servicio Nacional de Estadística y Censos (Minsterio de Economía y Comercio) Dirección General de Sanidad[9] (Servicio Nacional de Salud—Ministerio de Salubridad, Asistencia y Previsión Social)
Colombia[6, 12]	Office of Notary Public or of the Mayor[14] [Municipal]	None[14]	Departamento Administrativo Nacional de Estadística
Ecuador	Oficina del Registro Civil [Cantonal]	Dirección General del Registro Civil (Ministerio de Gobierno)	Dirección General de Estadística y Censos[9] (Ministerio de Economía) Dirección General de Sanidad[13] (Ministerio de Previsión Social, Trabajo y Sanidad) Dirección General del Registro Civi (Ministerio de Gobierno)

(Continued on following page)

Table 2. Agency of Government Reported To Be Responsible for Civil Registration Function at Local and National Levels and for Compilation of National Statistics on Live Births, Deaths, Stillbirths, Marriages, and Divorces: 65 Countries, as of 1 January 1950—*(Continued)*

Continent and country	Registration		Statistics
	Agency responsible at subnational (local) level	Agency directly responsible at national level	Agencies responsible at national level
Paraguay[12]	Oficina de Registro del Estado Civil de las Personas[16] [Municipal]	Dirección General del Registro Civil de las Personas (Ministerio de Justicia y Trabajo)	Dirección General de Estadística y Censos (Ministerio de Hacienda) División de Bioestadística[17] (Ministerio de Salud Pública y Previsión Social) Dirección General del Registro Civil de las Personas (Ministerio de Justicia y Trabajo)
Peru[6]	Oficina de Registro del Estado Civil	None	Dirección Nacional de Estadística (Ministerio de Hacienda y Comercio) Dirección de Salud Pública[13] (Ministerio de Salud Pública y Asistencia Social)
Uruguay	Oficina del Registro del Estado Civil [Seccional]	Dirección General del Registro del Estado Civil (Ministerio de Instrucción Pública y Previsión Social)	Dirección General del Registro del Estado Civil[15] (Ministerio de Instrucción Pública y Previsión Social) Departamento de Estadística Vital[9] (Ministerio de Salud Pública)
Venezuela	Oficina de Registro del Estado Civil [Municipal] Unidad Sanitaria[18]	Dirección de Salubridad Pública[19] (Ministerio de Sanidad y Asistencia Social)	Dirección General de Estadística y de Censos Nacionales (Ministerio de Fomento) Dirección de Salubridad Pública[20] (Ministerio de Sanidad y Asistencia Social)
ASIA			
Burma	Health Department [town][21] Village headman [rural][21]	Office of Registrar-General (Ministry of Health and Local Government)	Directorate of Medical and Public Health Services[22] (Ministry of Health and Local Government)
Ceylon	Office of Divisional Registrar[23]	Registrar-General's Department (Ministry of Home Affairs and Rural Development)	Registrar-General's Department[24] (Ministry of Home Affairs and Rural Development)
India[25]	Health Department or Land Revenue Department [Municipal][26] Village headman, Police or Revenue Station [Rural][26]	None	Directorate-General of Health Services[27] (Ministry of Health)
Indonesia (European population)[28]	Civil Registrar's Office [Civil Service]	None	Central Bureau of Statistics (Ministry of Economic Affairs)
Iran	Statistics and Civil Registration Office [Regional]	General Department of Statistics and Civil Registration (Ministry of Interior)	General Department of Statistics and Civil Registration (Ministry of Interior)
Israel	District Health Office[29]	Ministry of Health[29]	Central Bureau of Statistics and Economic Research (Prime Minister's Office)
Japan	Local administrative authorities *Koseki–Kakari*	None	Division of Health and Welfare Statistics (Ministry of Health and Welfare)
Jordan[6]	District Health Office [30] Headmen [small towns and villages][30]	Central Public Health Department[30] (Ministry of Health)	Central Public Health Department[31] (Ministry of Health) Statistical Department[15] (Ministry of Economy)
Lebanon[6]	Bureau de l'état civil [local]	Service de l'état civil (Ministère de l'intérieur)	Service de l'état civil (Ministère de l'intérieur)

(Continued on following page)

Table 2. Agency of Government Reported To Be Responsible for Civil Registration Function at Local and National Levels and for Compilation of National Statistics on Live Births, Deaths, Stillbirths, Marriages, and Divorces: 65 Countries, as of 1 January 1950—*(Continued)*

Continent and country	*Registration*		*Statistics*
	Agency responsible at subnational (local) level	*Agency directly responsible at national level*	*Agencies responsible at national level*
Pakistan[25]	Municipal Health Department [urban][26] Village watchman, Police or Revenue Station [rural][26]	None	Office of Director-General of Health[32] (Ministry of Health and Works)
Philippines[12]	Office of Civil Registrar [Municipal]	Office of the Registrar-General (Bureau of Census and Statistics, Department of Commerce and Industry)	Bureau of Census and Statistics (Department of Commerce and Industry)
Syria[6]	Department of Civil Registration	Department of Civil Registration (Ministry of the Interior)	Department of Statistics (Ministry of National Economy)
Thailand	Municipal Office [urban][33] Headman of Commune or Committee of District [rural]	Central Registration Office (Ministry of Interior)	Department of Public Health[9] (Ministry of Public Health) Central Registration Office[15] (Ministry of Interior)
Turkey[6]	Population Office ["Common"][2] Health Office [District][9]	Directorate-General of Population Affairs[2] (Ministry of Interior)	Directorate-General of Population Affairs (Ministry of Interior) Central Statistical Office[34] (Office of Prime Minister) Division of Health, Education, and Statistics[35] (Ministry of Health and Social Welfare)
EUROPE			
Austria	Local Registrar's Office	None	Austrian Central Statistical Office
Belgium	Office de l'état civil [communal]	None	Institut national de statistique (Ministère des affaires économiques et des classes moyennes)
Czechoslovakia	Local National Committee[2]	None	State Statistical Office
Denmark	Parish Registry[2] Civil Registry[36]	None	Statistical Department (Ministry of Finance) National Health Service[37]
Finland	Parish Registry Civil Registry	None	Central Bureau of Statistics (Office of Prime Minister)
France	Office de l'état civil [communal]	None	Institut national de la statistique et des études économiques (Ministère des finances et des affaires économiques)
German Federal Republic	Civil Register Office (*Land* Ministry of Interior)[2]	None	Federal Statistical Office (Ministry of Interior)
Greece	Office de l'état civil [municipal or communal]	None	Statistique nationale (Ministère de la coordination)
Iceland	Parish Registry[2]	None	Statistical Bureau (Ministry of Finance)
Ireland[6,12]	District Registrar's Office	General Register Office (Department of Health)	Central Statistical Office (Office of Prime Minister)
Italy[12]	Ufficio di Stato Civile [Communal]	None	Istituto Centrale di Statistica (Office of Prime Minister)
Liechtenstein	Civil Registry Office [Communal]	None	Government
Luxembourg	Office de l'état civil [communal]	None	Office de la statistique générale (Ministère des affaires économiques)

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Table 2. Agency of Government Reported To Be Responsible for Civil Registration Function at Local and National Levels and for Compilation of National Statistics on Live Births, Deaths, Stillbirths, Marriages, and Divorces: 65 Countries, as of 1 January 1950—*(Continued)*

Continent and country	Registration		Statistics
	Agency responsible at subnational (local) level	Agency directly responsible at national level	Agencies responsible at national level
Monaco	Bureau de l'état civil	Service de l'état civil	Service municipal de la nationalité et de la statistique
Netherlands	Registry of Civil Status [Municipal]	None	Central Bureau of Statistics (Ministry of Economic Affairs)
Norway	Parish Registry[2]	None	Central Bureau of Statistics
Poland	Civil Registry Office [Communal]	None	Central Statistical Office (National Planning Office)
Portugal	Conservatória do Registo Civil	None	Instituto Nacional de Estatística (Ministério das Finanças)
Spain[12]	Oficina de Registro Civil [Municipal]	Dirección General de los Registros Civil de la Propiedad y del Notariado (Ministerio de Justicia)	Instituto Nacional de Estadística (Presidencia del Gobierno)
Sweden	Parish Registry	Central Office of National Registration (Central Bureau of Statistics, Ministry of Finance)	Central Bureau of Statistics (Ministry of Finance)
Switzerland	Office de l'état civil [cantonal]	None	Bureau fédéral de statistique (Département de l'intérieur)
United Kingdom:			
England and Wales	Local Register Office [Subdistrict][2]	General Register Office[2]	General Register Office[38]
Northern Ireland[6]	Local Register Office [District][2]	General Register Office[2] (Ministry of Finance)	General Register Office[39] (Ministry of Finance)
Scotland	Local Registrar's Office [District][2]	General Registry Office[2]	General Registry Office[40]
Yugoslavia	Bureau de l'état civil [local][2]	None	Office fédéral de statistique (Conseil économique)
OCEANIA			
Australia	District Registry Office (State Registrar General's Office)[2]	None	Commonwealth Bureau of Census and Statistics (Department of the Treasury)
New Zealand	District Registrar's Office[2]	Registrar-General's Division[2] (Department of Justice)	Census and Statistics Department[4] Department of Health[37]

[1] Responsible for registration of live births, deaths, and stillbirths only. Marriage and divorce of Moslems are registered by Moslem court registrars (Masoons) and Moslem tribunals; for Christians and Jews, the church or synagogue is responsible; for foreigners, the consulates. Statistics of marriage and divorce—like those of live birth, death, and stillbirth—are compiled by the Statistical Department.

[2] Not responsible for the registration of divorces. Divorces are registered only as part of the records of the courts concerned, and statistical reports are transmitted by the court authorities to the State or national statistical service, except in Northern Ireland and Scotland, where judicial authorities have statistical responsibility (see notes 39-40).

[3] Except for the Province of Ontario where the Office of Registrar of Vital Statistics is in the Department of Municipal Affairs, the agency responsible for registration is variously known as the Registrar-General's Office, Office of Vital Statistics, Division of Vital Statistics, or Demographer's Office (Quebec) in the provincial departments of health. In most provinces, these offices are responsible for registration of all vital events. For detailed statement, see Table 1, notes 3-4.

[4] Live-birth, death, marriage, and divorce statistics. (For Haiti, only since 1952, following the establishment of the Institut haïtien de statistique.)

[5] For stillbirths and cause of death from reports of medical attendant and, beginning 1952, statistics of live births also from medical attendant reports.

[6] Civil registration of stillbirths is not compulsory, but in El Salvador, Honduras, Colombia, Peru, Syria, and Turkey, statistics of stillbirth are compiled from other sources; and in Ireland, the Minister of Health is now empowered to collect statistics on them by the Vital Statistics and Births, Deaths and Marriage Registration Act of 1952.

[7] By authority of government decree issued 6 July 1951, statistical sections in Ministerio de Salud Pública y Asistencia Social were transferred to Dirección General de Estadística, thus centralizing vital-statistics compilation.

[8] Since the establishment of the Institut haïtien de statistique on 4 September 1951, the help of the rural police officers of the Haitian army has been enlisted in the registration of births and deaths occurring in rural areas,

(Continued on following page)

(Footnotes to Table 2 —concluded)

this being supplementary to the information gathered and transmitted by the civil registration officers. The data so obtained are sent to the Institut haïtien de statistique for verification and compilation, as are regular reports on live births, deaths, marriages, and divorces registered by the civil register offices.

[9] Live-birth, death, and stillbirth statistics only.

[10] Prior to January 1953, the Departamento de Salud Pública was responsible for compilation of statistics on live births, deaths and stillbirths, and the Registro Civil for live births, deaths, marriages, and divorces. Beginning 1953, these responsibilities have been centralized in the Dirección de Estadística y Censo in the Contraloría General de la República.

[11] Except for the State of Massachusetts where the Registrar of Vital Statistics is in the Department of State, the agency responsible for registration of live births, deaths, and stillbirths—and where applicable, marriages and divorces—is variously known as a Division of Vital Statistics, Bureau of Vital Statistics, or Record and Statistics Section in the State department of health. Registration of marriages and divorces is less systematized than that of births and deaths. For a more detailed statement concerning these registers, see Table 1, notes 7-8.

[12] Divorce, in the sense used here, does not exist; therefore, there is no provision for registration or for statistics. (On 14 December 1954, divorce became legal in Argentina.)

[13] Live-birth, death, and stillbirth statistics for the principal cities.

[14] During 1952, a government decree was issued making registration the responsibility of the Registraduría Nacional de Estado Civil.

[15] Marriage and divorce statistics only.

[16] For live births, deaths, and stillbirths in areas having health services, registration takes place only upon receipt of "authorization" which confirms the fact that statistical report of each event has been received by the División de Bioestadística or by the local Unidad Sanitaria.

[17] Live-birth, death, stillbirth and marriage statistics for areas having health services.

[18] Responsible for the registration of births in organized notification areas, including capitals of states and other cities of importance. In these notification areas, registration is *also* made in civil register.

[19] Exercises responsibility at national level for the registration of births in organized notification areas (see note 18 above) and for instructions on registration of deaths for the country as a whole. There is no other national registration authority.

[20] Compiles statistics on cause of death and stillbirth for the whole country and for births in organized notification areas.

[21] Live births, deaths, and stillbirths only; marriages are registered only by officiant in place of marriage. There are no prescribed forms or procedures for their registration, and no statistics are compiled. Divorces are registered only as part of records of court concerned; no statistics are compiled.

[22] Live-birth and death statistics in selected towns only.

[23] Not responsible for registration of divorces. Divorces dissolving "General" and "Moslem" marriages are registered only by the court concerned; those dissolving "Kandyan" marriages are registered by provincial and assistant provincial registrars.

[24] Beginning 1952, the responsibility for compilation of national vital statistics was transferred to Department of Census and Statistics in Ministry of Finance.

[25] Registration is compulsory only for live births and deaths under provincial and municipal legislation. Civil registration of marriage and divorce does not exist for Hindus and Moslems. For Christians, Parsees, and other minor sects, registration is the responsibility of ecclesiastical and judicial authorities.

[26] Registration of live births, deaths, and stillbirths is the responsibility of each individual state or province, and while some variation with respect to the state agencies responsible for registration and compilation is evident, the salient features of the systems are much the same throughout the country. In general in all municipalities (urban areas), responsibility is placed in the municipal health department or in the land revenue department of the municipal administration. In rural areas, there is more variation, the function of registration being exercised variously by the police station, railway station, revenue office, forest department, estate superintendents, cantonments, or through the village headman or watchman.

[27] Live-birth, death, and stillbirth statistics only; statistics of marriage and divorce are not compiled even for those events which are recorded in ecclesiastical or other registers. Beginning 1951, compilation of national vital statistics was nominally transferred to the "Office of the Registrar-General" (Ministry of Home Affairs), the reconstituted "Census Office".

[28] Registration of births, deaths, and stillbirths among Indonesian population is not compulsory (see Table 1, note 18), and marriages and divorces among Moslem population are registered at the mosques. Therefore, no administrative organization exists for registration except for the European segment of the population, though some Indonesians (both Christian and other) and foreign Asiatics have voluntarily registered births and deaths in the European civil register. A voluntary nation-wide system based on the village administration and the Ministry of Health is under experimentation.

[29] Responsible for registration of live births, deaths, and stillbirths only. Marriages and divorces are registered by the Rabbinical Offices (Ministry of Religious Affairs) and by the Ministry for Internal Affairs. Statistics of marriage and divorce, however—like those of birth and death—are compiled by the Central Bureau of Statistics and Economic Research.

[30] Responsible for registration of live births and deaths only. Marriages and divorces are registered by the religious courts, responsible at national level to the Central Religious Court.

[31] Live-birth and death statistics only.

[32] Live-birth and death statistics only. Data on stillbirths are not compiled, and statistics of marriage and divorce are not compiled even for those events which are recorded in ecclesiastical or other registers.

[33] Responsible for registration of live births, deaths, and stillbirths only. Marriages and divorces are registered by the district committee or the headman of the commune, both of whom also register live births, deaths, and stillbirths in rural areas.

[34] Live-birth and death statistics in provincial capitals; statistics of marriages registered in provincial and district capitals; all divorce decrees. An experiment to collect reports on births and deaths in all villages of three provinces is also under way.

[35] Live-birth, death, and stillbirth statistics in 7,000 of the 36,000 villages.

[36] Responsible for registration of civil marriages (religious marriages are entered in parish registers) and, in "sønderjydske" parts of the country, for registration of births and deaths also. Deaths in "sønderjydske" parts are also registered in the parish registers, but births and civil marriages are not.

[37] Cause-of-death statistics only.

[38] The Lord Chancellor's Department also compiles divorce statistics.

[39] Not responsible for divorce statistics, which are compiled by High Court of Justice.

[40] Not responsible for divorce statistics, which are compiled by Scottish Home Department.

With respect to the types of organization established for registration, an analysis of information in table 2 makes clear that the local registration units are under direct centralized control in 28 of the 65 countries. In these 28 countries, the central or national registration authority has a direct relationship with the local register offices and constitutes — with various state and local components — a more or less tightly bound integrated system responsible for the registration of vital events and the custody of vital records. Among the 37 countries for which a central registration office is *not* shown, there exists general control exercised through the ministry which has jurisdiction over the sub-divisions that are the registration units, and which administers the affairs of the local registration office in so far as instructions, application of the civil code, supplies, personnel, and so forth, are concerned. Some of these ministries, among which are represented "justice" and "interior," exercise relatively close control, issuing detailed instructions for the interpretation of the provisions of the civil code and providing strict inspection services. But, in general, these supervisory functions are nominal in character and, in fact, the registration units operate relatively independently.

It should be emphasized, however, that the type of organization, in terms of centralization of control or lack of it, is not determined solely by abstract administrative considerations. The traditions and culture of a country are very important factors in fixing this structure, as are the physical size of a country and its form of government. For example, in federated countries, among which are found the United States, Canada, Australia, and Argentina, the distribution of constitutional power does not empower the federal government to enact legislation of a national scope in the field of vital statistics. Accordingly, registration from the national viewpoint is decentralized geographically and comes within the competence of the individual states or provinces.[14] Moreover, countries of large area and great distances like these as well as India and Brazil might find excessive difficulties in administering a centrally controlled registration system.

(b) *Advantages of centralized control*

Although it is recognized that administrative efficiency is not the sole factor determining the type of organization for registration which a country might establish, still it seems clear that under some circumstances, the centralization of registration under a national authority would have certain advantages. Other factors being equal, centralized control would almost surely facilitate standardization of forms, procedures and methods. If properly administered, it should also stimulate improved registration by means of technical co-ordination, advice and assistance to registrars. The uniform interpretation of the registration law, the development of comparable procedures of a specified standard of excellence, the adherence to a definite time schedule of reporting — all can be established and maintained more easily through a system of national control.

Countries which lack national control of the fundamental function of registration must devise substitute systems of co-ordination and methods of promotion to achieve improvement and standardization of procedures and results. In the cases of the United States, Canada and Mexico, for example, the need for co-ordination of the primary units is met by the national vital-statistics service. The National Office of Vital Statistics in the United States and the Dominion Bureau of Statistics in Canada have no jurisdiction over the state and provincial health departments which, it will be seen from table 2, are in charge of registration, but they are responsible for the development of an integrated vital-records system which would meet the needs of the various agencies concerned with national vital statistics. Under this authority, the national statistical offices in the United States and Canada exercise a co-ordinating function, which takes the form of proposing model laws for registration, standard report forms, and uniform practices with respect to definitions and procedures. In Mexico, the need for co-ordination is met by making the *registros civiles* auxiliary organs of the Federal Statistical Service.

(c) *International recommendations*

Recognizing the basic importance of the concept of centralized control, the United Nations has included in the *Principles*[15] a recommendation on organization which reads as follows:

"205. *Organization for registration at local and national level*

"(*a*) When the administrative and geographic organization of the country permits, responsibility for effecting the legal registration of vital events should be placed on official local agencies which are directly dependent, in so far as registration matters are concerned, on a national office which can co-ordinate, unify, supervise, and promote registration efficiency to the end that it satisfies both legal and statistical needs.

"(*b*) In case direct dependence from the national level is not possible, the appropriate national office should have the functions of co-ordination."

The method of implementing this recommendation may vary from country to country, but the necessity of achieving the objective of direct control or its alternative, effective co-ordination, cannot be over-emphasized.

2. Agency administering registration

Whether the local registration offices are branches of a national registration office or solely parts of the local civil-administration structure, they all fall within the jurisdiction of some higher authority in the public administration. These administering authorities may be of three types — civil, ecclesiastical, or public health.

The municipal registration office of Europe and Latin America, and the police or revenue stations of Asia are examples of local registration controlled by what may be called "civil government". The parish

[14] With respect to the United States, the situation has been described as follows: "The Federal Government has no express constitutional power to enact vital statistics legislation of a national scope" and can only "rely upon the voluntary cooperation of the States to provide the necessary vital statistics" and encourage and stimulate the States "to enact uniform registration laws." ("Uniform Vital Statistics Act" by James C. Wilkes. *Report of the Proceedings of the First National Conference of State Registration Officials.* Department of Commerce. Bureau of the Census. Vital Statistics — Special Reports, Vol. 9, No. 65, Washington, 27 September 1940. p. 872.)

[15] *Principles for a Vital Statistics System, op. cit.* p. 7.

registers of the Scandinavian countries, although civil in the legal sense, are within the jurisdiction of church authorities. Examples of the local registration offices which function as part of the public-health services are those found in the health-bureau registers in Egypt and the state and provincial departments of health in the United States and Canada.

Local offices, under the jurisdictions mentioned above, have charge of registering live births, deaths and stillbirths. In most countries of the world, the registration of marriages also comes within the same jurisdiction. Only four countries place marriage registration under an authority other than that which controls the registration of live births and deaths. These are Egypt and Jordan, which place marriage registration in the religious courts; Israel, where the rabbinical offices have jurisdiction; and some states of the United States of America, where the licensing clerks of the county or municipal courts register marriages. In addition, it might be mentioned that such marriages as are registered in India, Pakistan and Indonesia are recorded only in the mosques, churches, or synagogues.

The situation with respect to divorces is somewhat different. In every country of the world, divorces — if recognized — are registered automatically as part of the records of the court which issues the decree. In most countries, transcripts of these original records are sent to the registrar of births, deaths and marriages. But in Egypt, the Union of South Africa, many of the states of the United States of America, Burma, Ceylon (in part), Israel, Jordan, Turkey, Australia, New Zealand, and 9 European countries, the registrar of vital records is not responsible for registration of divorce. In these countries, the records of divorce remain in the custody of the court concerned, and the registrar of the other vital events has no responsibility.

(a) *National practice*

Local civil register offices. With the specific exceptions for marriage and divorce mentioned above, by far the greater number of countries of the world (49 out of 65) provide for registration of live births, deaths, stillbirths, marriages, and divorces in *civil register offices* (variously known as *oficina de registro civil, office de l'état civil,* and *local register office*). These operate either through a central registration office within a national ministry — usually "justice" or "interior" — or through the local civil government, which is indirectly under the jurisdiction of a ministry. The exact names of these local register offices will be found in table 2, together with the name of the national agency which directly controls the local office, accompanied by its ministerial dependency. Information is not complete for countries where, in the absence of direct central control, there is indirect ministerial dependency through the local civil administration. But, according to the data available for 16 countries, the same pattern of ministerial dependency appears to be present.

In addition to the 49 countries which have "civil" registers, seven other countries report a dual system of registration involving a civil register office plus a health-office registry, and two others have a civil register plus an ecclesiastical register.

The seven countries which place the registration duties on both civil and health authorities are Burma, Egypt, India, Jordan, Pakistan, Turkey and Venezuela. The first five of these put the responsibility on the health authorities alone wherever they exist (which is usually in urban areas) and make the village headman or the police officer responsible in rural areas. In Venezuela and Turkey, on the other hand, there is duplicate registration in areas where health units exist. This duplication of authority has developed in an attempt to improve registration by pressing into service the resources of the health department wherever its administrative machinery has been established. In general, it means that in urban areas primarily, the health authorities have parallel jurisdiction with the civil registration services.

Ecclesiastical registers. In five countries, namely Denmark, Finland, Iceland, Norway and Sweden, registration of all vital events is wholly or in part an ecclesiastical function.[16] These five countries, plus the province of Quebec in Canada, are the only remaining examples of the ecclesiastical registers — the type which, it will be recalled from chapter I, was the first vital register in almost every country of the Western world. The principal differences from the original ecclesiastical registration systems are that in the existing systems the parish clergy act in a civil capacity in that they register "vital events" rather than "church events" and register all such events, not only those among the selected segment of the population which is affiliated with the parish in question.

Health-department registers. Health authorities are predominant in the registration field in nine countries, namely Burma, Canada, Egypt, India, Ireland, Israel, Jordan, Pakistan and the United States, although in five of these, there is a "civil" register in rural areas. In Canada and the United States of America, the provincial and state departments of health have responsibility for registration of vital events and for collection and publication of local vital statistics, although the local registration official may be an employee of the local government and not administratively responsible to the health authorities.

In Burma, Egypt, India, Jordan and Pakistan, the urban registers are manned by the health officers while rural registration is usually the responsibility of one or more of the following individuals: the headman (*mukhtar*) of the village, the police officer, a minor civil servant, a tax collector, or a watchman. It is possible that as health units are set up in every part of these five countries, registration may become solely the responsibility of the health departments. However, in India where the entire question of vital records and statistics recently has been reviewed and recommendations for improvement made, there is a feeling that it would be unwise to combine vital-statistics organization with that of the Health Department.[17] They have, therefore, in 1951 set up an Office of the Registrar-General which, under the administrative control of the Ministry of Home Affairs, is responsible for population and vital statistics.

(b) *Advantages and disadvantages of "civil" or "health" administration of local registration*

Civil. The advantages of making an independent civil authority, rather than an agency with substantive interests, responsible for registering vital events are two.

[16] As noted previously, marriage and divorce are registered by religious authorities in Egypt, Jordan and Israel.

[17] *Report of the Health Survey and Development Committee,* Vol. II, *Recommendations, op. cit.* p. 280.

First, the civil authority, represented by the local public administration, is nation-wide in its scope. By the nature of government structure, every local area is integrated in some manner into the whole and, as such, forms part of the network essential for nation-wide vital registration. Thus, by establishing vital registration as part of the civil local government, one of the requisites — that of complete geographic coverage — is achieved.

The second advantage lies in the sphere of interests of the local civil government. Local governmental units have administrative or legal interests which tend to be universal, oriented as they are toward the satisfaction of the legal requirements of the civil code. There is, therefore, no tendency to limit interest in registration to the recording of live births, deaths and stillbirths. The registration of all vital events, including marriage and often divorce, is considered the responsibility of the civil register.

Under this type of organization, the legal nature of the process assumes paramount importance and, concomitantly, the influences which can be brought to bear on the informant to ensure completeness of registration can be that much stronger. The rigid requirements of the civil code which makes the records of the civil register *prima-facie* evidence of citizenship, age, and so forth, also result in these records becoming prerequisites to other communal obligations and privileges, and the incentives to registration are thereby strengthened and increased.

Ecclesiastical registration is, in the modern sense, only a variation of the civil register in which the clergy act as registrars, and it has the same general advantages and disadvantages.

The disadvantages of placing a non-substantive civil authority in charge of registration arise from the legal character which the organization tends to assume under these auspices. The satisfaction of only the legal registration requirements may tend to stifle or hinder the satisfaction of broader interests, including those of public health and demography. Statistical needs in such a system may have a tendency to take on a definitely secondary character. Thus, there may be objections to having the registrar secure information required only for medical or demographic purposes. Moreover, there may be lack of interest in acquiring good statistical personnel or an adequate budget.

Health. The jurisdiction of health authorities over registration has the great advantage of identifying the needs and interests of public health with those of the registration authorities and of exploiting to the full the public-health possibilities of the data. Under progressive leadership, this type of organization tends to produce vital records and statistics of high calibre and of special usefulness to public-health workers. Furthermore, in areas where a public-health organization has been established and civil registration has not, the health organization provides a convenient administrative mechanism for the installation of a vital-statistics system.

Another advantage of having the health authorities responsible for registration is that a medical organization, being influential with the medical profession, can secure more accurate cause-of-death information than a non-medically supervised system would be able to do. This argument is valid only if doctors are generally available throughout the registration area — a premise which is not always correct. If most deaths are unattended by a physician, it will not be possible for the registrar to obtain an accurate certification of the cause. Providing that doctors attend cases and certify the cause of death, a system of medical certification of cause can work just as effectively in co-operation with civil registrars. An interesting commentary on the merits of the health-authority jurisdiction over registration, and the medical man as registrar, was made by Noel Humphrey in his discussion of a paper by Dudfield.[18] Mr. Humphrey is reported to have said that:

> "Speaking from experience, he knew that doctors did not as a rule make good registrars. In the first place their handwriting, speaking generally, was not clerkly in character; and they were, moreover, apt to lose sight of the fact that the primary object of civil registration was to effect an accurate and legal record of each birth and death. The medical press and medical men generally seemed to think that the civil registration of births and deaths was mainly devised for the promotion of public health. Civil registration had fortunately been the means of promoting public health, but that was not the primary object of civil registration."

A disadvantage of identifying the health department with the registration function is one which might be termed "economic" in character. The development and custody of vital records are matters which involve legal considerations on a broad scale, and the health department is not always equipped to handle this aspect nor, except in a limited sense, is it interested in it. Under the jurisdiction of the public-health department, registration offices are usually set up in established health centres. Except in advanced countries, the health department usually lacks nation-wide coverage and is, therefore, not designed to provide nation-wide civil registration facilities. Where a health centre does not exist, some other civil administration must be called upon to assume responsibility for registration, and the result may be a dual and unco-ordinated system as exists in India, Burma, Jordan, and Pakistan.

A second drawback of a related type is the natural tendency of health departments which control registration to concentrate on promoting the recording of live births, deaths, and stillbirths rather than the whole area of vital events, including marriages and divorces. This, of course, would be expected in a system which is under the auspices of a ministry in which its definite substantive interests must receive first consideration. A further extension of this economic problem of priorities is that while the health department is required to divert time and money to the legalistic registration functions, health statistics which might be considered the primary statistical responsibility of the health authorities may tend to languish.

Summary. To sum up, it may be said that the type of registration organization adopted must be in accordance with the conditions in each country and should be established on the existing governmental

[18] Discussion on Mr. Reginald Dudfield's Paper, "A Critical Examination of the Methods of Recording and Publishing Statistical Data Bearing on Public Health; with Suggestions for the Improvement of Such Methods," *op. cit.* p. 42-43.

structures, taking advantage of the administrative machinery already established. The facilities of the health department may be employed to assist in registration, as is done in many countries where the medical personnel involved must notify the ocurrence of a birth or death to the registrar. Similarly, several countries draw upon the assistance the church can lend by forbidding a baptism to take place without prior civil registration. Such interlocking checks and controls will be discussed in more detail in chapter XIV, p. 203.

C. Organization for compilation of vital statistics

The responsibility of a government agency to collect from the registration office statistical reports on vital events and to compile from these reports national vital statistics is usually established either by the general statistics act or by a special vital statistics act. The statistical services of a country through which the provisions of the statistical law are implemented may be organized in a variety of ways,[19] but each pattern can be considered from two points of view. These two considerations have to do with (1) whether subject-matter statistics (such as vital statistics or agriculture statistics) are compiled, together with most other types of statistics, in a central statistical office, or whether statistics on a particular subject are produced in the ministry which has special need for them; and (2) whether the services, either centralized or decentralized with respect to subject matter, are centralized or decentralized geographically. In a more restricted sense, each of these general aspects can be considered in relation to vital statistics alone. The "geographic" aspect will be considered first.

[19] *Handbook of Statistical Organization.* United Nations. Statistical Office. Document ST/STAT/SER.F/6, December 1954. 138 p. (Sales No. 1954.XVII.7)

1. Geographic centralization or decentralization

In contrast to the implications of "centralized" and "decentralized" control in connexion with registration, with respect to compilation of vital statistics, these terms refer not so much to the organization of the service itself as to the *method* by which vital statistics are compiled. The "geographically centralized type of organization" is one in which individual reports on each vital event are channelled to a central agency which, using these individual reports, edits, queries, codes, classifies, and tabulates the data to produce "statistics". In the decentralized type of organization for compilation, the statistical unit at a subnational political or geographic level prepares the tabulations in accordance with the specifications issued by the central agency in its capacity as the co-ordinating or directing agency and passes the finished tables on to the central authority. Data tabulated at the various subnational offices are then consolidated at the central level to provide data for the country as a whole.

(a) *National practice in 65 countries*

The *method* of compiling vital statistics, that is, the aspect which can be characterized as geographically "centralized" or "decentralized", is best exemplified for individual countries by an analysis of the statistical forms used at the national level for the compilation of statistics of live birth, death, stillbirth, marriage, and divorce. This information for 65 countries is set forth in table 12 on p. 105.

According to table 12, there are 14 countries which report that some of their vital statistics are compiled at the national level from "summaries" prepared at a subnational level or that, in other words, compilation of national vital statistics is decentralized geographically to some degree. The fourteen countries involved, together with an indication of the statistics affected, are given below. In this tabulation, an "0" indicates that statistics are not compiled on this subject.

Table A. Countries which employ decentralized compilation for some aspect of vital statistics

	Live birth	*Death*	*Stillbirth*	*Marriage*	*Divorce*
Australia	Centralized	Centralized	0	Centralized	Decentralized
Belgium	Centralized	Decentralized	Decentralized	Centralized	Decentralized
Burma	Decentralized	Decentralized	Decentralized	0	0
Canada	Centralized	Centralized	Centralized	Centralized	Decentralized
German Federal Republic	Decentralized	Decentralized	Decentralized	Decentralized	Decentralized
India	Decentralized	Decentralized	Decentralized	0	0
Lebanon	Decentralized	Decentralized	0	Decentralized	Decentralized
Liechtenstein	Decentralized	Decentralized	Decentralized	Decentralized	0
Pakistan	Decentralized	Decentralized	0	0	0
Spain	Decentralized	Decentralized	Decentralized	Decentralized	0
Syria	Decentralized	Decentralized	Decentralized	Decentralized	Decentralized
Thailand	Decentralized	Decentralized	Decentralized	Centralized	Centralized
United States	Centralized	Centralized	Centralized	Decentralized	Decentralized
Yugoslavia	Decentralized	Decentralized	Decentralized	Decentralized	Decentralized

It will be observed that the degree to which compilation is geographically decentralized is not uniform within the group. Canada, the United States, and Australia, for example, use the decentralized system for marriage and/or divorce statistics only; Belgium employs it for death, stillbirth, and divorce; the rest of the countries use geographically decentralized compilation exclusively. It may be interesting to note in this connexion that Burma and Yugoslavia are planning to centralize compilation as soon as possible, and Canada is experimenting with an individual divorce transcript for statistical purposes.

(b) *Disadvantages of "decentralized" compilation*

In terms of efficiency, the geographic decentralization of the statistical service, under which national vital statistics are compiled by consolidating subnational summaries, is not likely to produce data of the high order of accuracy, timeliness, and adequacy which is expected of an effective statistical system. Direct and centralized tabulation is almost a prerequisite to uniform and reliable vital statistics. This subject will be explored more completely in connexion with the "form of the statistical report" in chapter VIII and in relation to the tabulation process, chapter XI, but suffice to say here that the merit of centralized compilation is based on its known advantages in terms of the application of uniform standards of editing, coding, and classifying, and the increased flexibility of the tabulation programme under these conditions.

(c) *International recommendations*

League of Nations. In connexion with cause-of-death tabulation, the "Group Entrusted with the Study of the Causes of Death" of the League of Nations Health Section in 1925 expressed its concern with the problem of centralized versus decentralized tabulation of cause of death and recommended "that a resolution should be passed by the Health Committee of the League of Nations to the effect that the general adoption in all countries of centralised, as opposed to local, tabulation . . . would be a powerful means of promoting efficiency and comparability".[20]

United Nations. The principle of centralized collection and compilation is such a fundamental one that the United Nations, in developing the *Principles for a Vital Statistics System,*[21] broadened the application of "centralized tabulation of cause-of-death data" as expressed by the League of Nations to make it applicable to all tabulations. The United Nations has recommended also that the office which compiles the data centrally should also be responsible for *collecting* the reports from the subnational offices in charge of registration. The two recommendations read as follows:

"303. *Organization for collection of statistical reports*

"(*a*) Reports on vital events for national statistical purposes should be collected centrally by the agency which is responsible for the statistical compilation.

"(*b*) If it is desirable for sub-national purposes, provision should be made for channelling original statistical reports through, or supplying copies thereof to, local, state or provincial departments of government which may require information on individual reports for statistical or other purposes."

"404. *Organization for compilation of national vital statistics*

"National vital statistics should be compiled on a centralized basis by a national agency specifically charged with this statistical function."

It has been shown that all except 14 of the 65 countries studied are already following this recommendation for the centralized tabulation of vital statistics, and of the 14 exceptions, three employ decentralized tabulation only for marriage and/or divorce statistics. The advantages of having direct control over the receipt of data, of being able to apply uniform coding rules and standards of interpretation, of carrying out the classifying and tabulating on a uniform but flexible schedule, cannot be emphasized too strongly. The application of the Principle to all vital statistics in all countries is a goal to be anticipated.

2. CENTRALIZATION OR DECENTRALIZATION BY SUBJECT

As noted above, statistics on any subject may be compiled, together with those for other subjects, in a central statistical office, or the preparation of statistics in particular subject-matter fields may be carried out either in the agency which collects the original data from the informant or in one which has an important interest in the subject matter of the data. Vital statistics, therefore, might be compiled in a central statistical office, in the register office which collects the basic data, or in one of the agencies considered to be most directly concerned substantively as, for example, the health agency. The central-statistical-office responsibility for vital statistics would represent centralization of statistical functions; vital-statistics compilation by the registration or health departments would denote decentralization of the statistical function.

(a) *National practice in 65 countries*

According to information in table 2 on p. 27, the Governmental agencies actually reported as engaged in compilation of vital statistics at the national level in 65 countries are the *central statistical office,* the *health service,* the *general register office,* the *census office,* and the *judicial authorities.* A tabulation of countries reveals that the number showing responsibility vested in one of the five services or in some combination of them is as follows:

Agency responsible for compilation	*Number of countries*
Central statistical services	39
Public-health authorities	6
Civil registration authorities	2
Statistics and health	8
Registration and health	3
Registration and judicial	3
Statistics, health, and registration	3
Statistics, health, and census	1

Several interesting facts can be seen from the above tabulation. First, it is evident that responsibility for compilation is not always centred in one governmental agency but is sometimes (in 18 cases) divided between two or more. It is also clear that, although vital events are registered and the statistical report made in the registration office, in only a few countries does this agency have responsibility for compilation — either wholly or in part. It is evident, therefore, that in most countries of the world, vital statistics are compiled by a governmental agency which has no direct control over the original data and that, for most countries, this compilation agency is the general statistical service.

The following detailed discussion of national practices with regard to organizational arrangements for vital-statistics compilation is based on table 2, which presents the situation as of January 1950. Since that date, Guatemala (1951) and Panama (1953) have transferred this function from the health services to the general statisti-

[20] League of Nations, Health Committee. C.M.1925. C.224. M.80, Appendix 3. p. 85.

[21] *Principles for a Vital Statistics System, op. cit.* p. 17.

cal office. Ceylon (1952) has transferred the function from the office of the registration authority to the statistical office. In Haiti, the central statistical service now supplements and extends the work of the health department, and India has placed nominal responsibility for compilation in a general registration office.

Statistical services. As will be seen from the above tabulation, the compilation of national vital statistics in 51 countries out of 65 was in 1950 the duty wholly or in part of the central statistical office, which is generally a dependency of the ministry of economy, finance, or interior, part of the office of the prime minister, or has ministerial level itself.

The 39 countries in which the statistical service in 1950 assumed *sole* control of national vital-statistics compilations were primarily European and Latin American, although Egypt, Canada, the Union of South Africa, Israel, the Philippines, Iran, and Indonesia are also of this group.[22]

In twelve additional countries, the statistical service either has responsibility for the major part of the function, as in Denmark and New Zealand, where it compiles all but cause-of-death statistics, and Peru, Ecuador, and Brazil where the health department compiles city statistics, or it participates with the health department in a divided (Jordan) or in a dual system of compilation as in Chile, Cuba, Paraguay, Venezuela, Turkey, and Guatemala (until 1951). The latter type of duality arises principally in cases where the statistical authorities, though officially charged with the responsibility for vital statistics, fail to exercise that responsibility to the satisfaction of the needs of the health department. To meet this unsatisfied need, the health authorities have either set up a separate collection area and compile statistics independently (Cuba, Venezuela, Turkey), or they compile duplicate vital statistics on reports received through the regular registration channels (Chile, Paraguay, Guatemala).

Placing vital statistics solely in the central statistical agency, as has now (1955) been done in 42 countries, has the advantage of focusing attention on the statistical aspects of the vital-statistics system and of bringing to bear on this phase the continuous services of trained statisticians and statistical facilities. Vital-statistics data under such a system are usually more extensive and exhaustive than they are under registration or health auspices. Each branch, i.e., live birth, death, stillbirth, marriage, and divorce statistics, all tend to receive appropriate emphasis in the tabulation programme and in the developmental or promotional activities carried out in connexion with registration. Moreover, under statistical auspices, the long-range viewpoint of programme development can be achieved more easily.

If mechanical equipment is available for statistical processing, it will most likely be located in the central statistical service and would, under this type of organization, be available to meet the needs of vital statistics. From the budgetary standpoint, the chances of obtaining adequate financial provision for vital statistics and for recruiting reliable and permanent personnel may be increased when this branch is part of the joint statistical operation.

[22] As of 1955, the group had been increased by the addition of Guatemala, Panama, and Ceylon, making 42 countries out of 65, or two thirds of the total where the central statistical services are exclusively in charge of vital statistics.

In the matter of co-ordinating vital statistics with other types of data, it is perhaps obvious that the possibility of obtaining co-ordination between vital statistics and population statistics, or between vital statistics and migration or social statistics, is enhanced by providing for their compilation under the same administration. Finally, it should not be overlooked that the uses of vital statistics and the needs they meet are not limited to one field, and it is possible that a wider usage will be made of vital statistics in a general statistical office than in a single substantive department.

In terms of a system, the type of organization which separates the statistical processing and subsequent analysis from the collection of the original information is not ideal. The lack of access to the original source of the data and the absence of direct control over the basic collection process are potential handicaps to the processer. In this type of organization, querying for omitted or incomplete data can be carried out only indirectly and through sufferance of another agency which may have little, if any, appreciation of the statistical needs. Definitions of the original data and instructions for their collection must be issued by the statistical authorities to personnel over which they have no administrative control. Time schedules are at the mercy of an independent agency. Under such circumstances, it is sometimes difficult to produce timely and reliable statistics which will meet all the needs. Unless direction is of the highest quality, vital statistics in a central statistical office may tend to become submerged by other statistical problems and interests.

Health services. A second type of organization for compiling vital statistics from reports on vital events places responsibility for this function in one of the substantive offices or ministries interested in these data, such as the public-health service. As of 1950, in a total of 21 countries out of 65, the health department was responsible for a portion of or all vital-statistics compilations.[23]

In 1950, the health authorities had complete responsibility in only 6 countries, namely the United States of America, Burma, Japan, Haiti, India, and Pakistan. In Cuba, Paraguay, Turkey, Chile, Uruguay, Thailand, Panama, Venezuela, Denmark, Peru, Brazil, Jordan, New Zealand, Ecuador, and Guatemala, the health authorities participated in some way, either duplicating the procedures in whole or in part as in Chile, Venezuela, Peru and Brazil; assuming responsibility for some aspect, for example, mortality and natality in Jordan and Thailand, and mortality in Uruguay; or compiling only cause-of-death statistics, as in Denmark and New Zealand.

As the principal consumers of vital statistics, the public-health authorities occasionally have assumed responsibility for compilation of vital statistics, especially in those areas where there existed neither an operating central statistical authority nor a national registration office responsible for vital statistics. In only one country, however, are both the registration and the statistical function solely in the health department. The country where this type of organization is in effect is the United

[23] Since 1950, four countries, namely Panama, India, Guatemala, and Haiti, have either transferred this function to the central statistical office as in Guatemala and Panama, supplemented it by the statistical services (Haiti), or placed compilation nominally in the general registration office (India).

States of America where, as noted previously, the control of registration is vested not in a national organization but, with the exception of one state, in the state health departments. India, Pakistan, and Jordan have somewhat the same type of organization in that registration in urban areas is the responsibility of the district and state health authorities, and vital statistics at the state and national levels is within the health department's jurisdiction. However, the bulk of registration in these countries falls outside the health department authority, because it takes place in rural areas where the civil authorities, in the person of the headman of the village, are responsible.

The principal advantage of compiling vital statistics in the health department is that the health authorities are able to bring to bear important pressures for the full exploitation of at least those vital statistics required for public-health purposes. Vital statistics developed under the general statistical or registration services may tend to become routine and stale, lacking — as they may — the flexibility required to change quickly in accordance with public-health demands. This is perhaps the primary advantage of locating vital statistics within the jurisdiction of the health authorities — the fact that such statistics as are needed for public-health purposes tend to become available more promptly, and the development of the subject is limited only by the interest and ability of the public-health leaders and their influence and strength in acquiring adequate budgetary support.

As noted in connexion with the statistical-authority jurisdiction, the compilation of statistics by an agency other than that which controls the source of the data is not always conducive to the preparation of statistics of the highest quality. In a maximum of six countries out of 65, the health services exercise some jurisdiction over both registration and statistics, and in three of these, namely the United States of America, India and Pakistan, the national office actually has no direct jurisdiction because of the geographically decentralized type of registration. Thus, the factor of direct control is an important one to consider in evaluating the advantages of health-department compilation of vital statistics.

A second factor, which may be termed a disadvantage of this type of organization, is a possible tendency of the health department in charge of vital statistics to exploit certain statistics, for example mortality, or even some special aspect of mortality, to the detriment of other aspects of the subject. In addition to the tendency toward one-sided development of vital statistics within the health department, there is the increased difficulty experienced by the health authorities in achieving the required co-ordination between vital statistics and other series such as population. The related statistics between which co-ordination must be maintained are usually compiled either in the central statistical office or in the appropriate substantive agency. In either case, there is no simple method of achieving co-ordination between the two separate ministries.

Very closely related to the issue of co-ordination between vital and other types of statistics is the problem of maintaining the long-range continuity of viewpoint necessary to the development of a well-rounded programme of vital statistics. The preservation of the point of view required to produce vital statistics which will consistently meet the full range of needs may be difficult in a health department where the specific statistical interests may change drastically from year to year, depending on the health programme.

A final factor to consider is that, in terms of governmental organization, the public-health department usually has been one of the last to develop in the hierarchy of government. Unless this department is adequately developed, vital statistics under its jurisdiction may suffer from neglect, both of professional personnel and of budgetary provision. In such cases, emphasis tends to remain on individual case records rather than on the mass statistical data.

Registration services. A third organizational arrangement for compilation of vital statistics, and perhaps the most logical, is the direct-line, one-authority control of both vital records and vital statistics by the registration authorities. Under this arrangement, the registration service is usually composed of a central "registrar-general's office" with responsibility for compilation, and with a network of peripheral offices control of which is exercised through subsidiary offices located in major civil divisions and cities. Such a system represents a completely centralized, direct-authority organization for registration and vital statistics which gives the statistical agency control of the basic data, an advantageous condition not met by any other type of organization for vital statistics.

In 1950, the registration authority had either complete or partial responsibility for vital statistics in 11 countries.

In England and Wales, Ceylon, and Lebanon, the general register office compiled all types of vital statistics, although in England and Wales, divorces are not registered in that office. The registration service shared the responsibility for compilation in Northern Ireland and Scotland with the judicial authorities which register divorces and compile divorce statistics; in Panama, Uruguay, and Thailand, with the health services, and in Turkey, Ecuador, and Paraguay, with both the health and statistical services, each of which was in charge of some aspect of vital statistics. Except for Ceylon and Panama, the 1950 type of administration is in effect in 1955.

The outstanding advantage of the general register organization for vital statistics is the fact, noted above, that the agency in charge of compilation has direct access to the original data and control over their collection. Instructions emanate from the national service and, theoretically, it should be simple to secure authorization for collection of any data for which there is a statistical demand.

The fact that the system is designed primarily to provide for the registration function makes it likely, or at least possible, that the statistical aspect may be neglected or placed at a disadvantage. For example, it may be noted that in Uruguay the registration authorities, who technically are in charge, have delegated part of the statistical function to the health department. In Ceylon, it was not until the statistical services took some responsibility for compilation that the "age of mother" was collected on the birth record. Likewise, Kuczynski[24] in studying the vital statistics of England and Wales also noted the absence of this item on the birth record for

[24] "Demography — Science and Administration" by R. R. Kuczynski. *Eugenics Review*, Vol. XXXVII, No. 1, London, April 1945. p. 12-22.

that country. The item was added to the statistical supplement form in pursuance of the Population (Statistics) Act, 1938. The Marriage Law Reform Society in its *Evidence to The Royal Commission on Marriage and Divorce,* January 1952, noted that "Our failure to provide the Commission with many relevant statistics calls attention to the lamentable deficiency of adequate statistics on divorce and other matrimonial orders."[25]

The tight centralization of the registration-type of organization may prove something less than advantageous also in that it may limit the number of persons who have the opportunity or inclination to become interested in demographic statistics and research and, thus, stifle the development of vital statistics.

D. International recommendation on organization of system

This survey of the types of organizations currently administering the vital-statistics system in some 65 sovereign countries has delineated the complexity of the organizations and their variations, as well as the fact that from year to year, many changes are made in the organizational arrangements. It reveals the significant fact that the registration function is, by and large, separate and distinct from the statistical function, and that the two functions are generally carried on under the auspices of different ministries within the government. Registration is the function of the registration offices, administered by the local civil administration, by the ecclesiastical authorities, or by the public-health service. Vital statistics, on the other hand, are primarily within the jurisdiction of the statistical authorities of the country. These statistical services may be constituent parts of the ministries of economy, finance, or commerce, or under the ministry of health; in either case, the compiling authorities rarely have more than co-ordinating control over the collection of the raw material. In 1950, only 17 out of the total of 65 countries reported any administrative connexion between the registration and the statistics functions and, by 1954, three countries had moved out of this group. This fact alone raises important problems of co-ordination which will be explored more fully in section E below.

In view of the complexity of the situation and the multiplicity of governmental organizations involved, any international recommendation would necessarily need to be general in character. The Statistical Commission of the United Nations, in considering this problem, therefore has set forth a recommendation[26] which reads as follows:

"104. *Designation of responsibilities for the vital statistics system*

"(*a*) Responsibility for the establishment or development of a national vital statistics system should be the function of a national governmental agency or agencies.

"(*b*) The assignment of functions should be accompanied by clear designation of duties and responsibilities with respect to registration, recording, reporting, collection, compilation, analysis, presentation, and distribution of data, and the critical evaluation of the system."

In applying this Principle, it may be said that the administrative arrangements for registration of vital events and the compilation of vital statistics should be such as will best meet the needs of the individual and the state for legal records and the interests of the consumers of vital-statistics data. The method chosen to meet these needs will be determined largely by national conditions. The structure of local and national government will decide the degree of autonomy allowed local units in the matter of registration. The relative development, power, and interest of the various branches of government concerned with vital records and statistics, that is, those charged with matters of health, statistics, or registration, will determine which of these agencies takes the responsibility for the machinery of the vital-statistics system. When health units covering the territory are well established, it may be considered natural that their resources would be called upon to discharge the vital-statistics function. When registration of vital events and other legal matters is a traditionally accepted and almost automatic function in a country, the dependence on the branch of government charged with these duties will be unquestioned. In the final analysis, the essence of the principle of organization should be the clear delegation of responsibility to the branch of government which can most expeditiously perform that function to the best satisfaction of all agencies and individuals concerned.

E. Methods of co-ordination between agencies responsible for registration and compilation of statistics

The co-ordination problem in the field of vital statistics has three distinct aspects, namely co-ordination between independent agencies which constitute the vital-statistics system, co-ordination between functional units within operating agencies, and co-ordination between vital statistics and other closely related fields. Recognizing the desirability of a definite expression of the necessity for co-ordination, the Statistical Commission included among the *Principles for a Vital Statistics System*[27] one which deals specifically with this problem in the following words:

"105. *Co-ordination between agencies with responsibilities in the vital statistics system*

"(*a*) Clear delineation of duties should be supplemented by arrangements for co-ordination of needs and services between official agencies concerned with the registration of events for legal purposes, those responsible for compiling facts for statistical purposes, and those who use these data for administrative or analytical purposes in connexion with economic and social matters, or for planning, operating, and evaluating public health programmes either on a national or an international scale.

"(*b*) Co-ordination, especially with respect to coverage, definitions, classification schemes and tabulation programmes, should also be maintained with the authorities responsible for the population census or

[25] *Evidence to The Royal Commission on Marriage and Divorce.* Marriage Law Reform Society. January 1952. London. 1952. p. 129.

[26] *Principles for a Vital Statistics System, op. cit.* p. 4.

[27] *Ibid.* p. 4.

other types of population statistics, with those in charge of migration statistics, with the agencies responsible for public health statistics, and other related social and economic statistics.

"(*c*) The co-ordinating mechanism established to achieve these objectives should have a direct relationship with the agency responsible for the general co-ordination of the national system of statistics.*

"* In some countries it has been found that co-ordination as recommended in this Principle has been facilitated through the establishment of 'National Committees on Vital and Health Statistics' (of which the Statistical Commission took note at its fifth session) or committees or councils of a similar character."

1. Co-ordination among agencies in the vital statistics system

The area in which it is most important to achieve co-ordination is that within the vital-statistics system itself or, in other words, between the agencies most directly concerned with the production and use of vital statistics. Production of vital statistics, including registration of vital events, is the responsibility of local government, ecclesiastical, health, judicial, and statistical authorities. Consumers of vital statistics are primarily the health and social-welfare services, in and out of government, commercial interests, demographers, economists, and sociologists, both governmental and private. Irrespective of which governmental agencies have administrative responsibility for vital records and statistics, the essential elements are the maintenance of close liaison among all services concerned and the elimination or avoidance of duplication of effort between these services. Consideration must also be given to the needs of the various private agencies and governmental departments which will use the resulting statistics, in order that provision may be made for the collection of the original data in the form required to meet their specifications. The extent and scope of the data may limit the subsequent classification and tabulation programme, but within such limitations, the tabulation programme must be designed to meet consumer needs.

(a) *Inter-agency committees*

Since the functions of registration and compilation may be delegated to several different governmental departments, one method for achieving the desired co-ordination of effort and result is the "inter-agency committee". The effectiveness of any such committee will depend on its composition, its methods of operation, and the prestige such a committee might have. In an effort to promote and systematize the creation of inter-agency committees, the World Health Organization at its First Assembly endorsed the "national committees on vital and health statistics" whose purpose, broadly stated, is to study the problem of producing satisfactory national and international statistics in the field of health.

The creation of such committees was proposed by the International Conference for the Sixth Revision of the International Lists of Diseases and Causes of Death in April 1948,[28] and the first six recommendations of Resolution 9, under which the proposal was made, read as follows (the seventh and eighth recommendations refer to specific country responsibilities):

"*Whereas* the needs by Health Organizations for current, reliable and comparable data;

"*Whereas* the relatively primitive character of the National Statistics Mechanisms for producing such data;

"*Whereas* the intimate relationship between Vital Records, Vital Statistics, Morbidity Statistics and Population Statistics; and

"*Whereas* the advantages of developing a degree of international uniformity in certain of these methods and procedures,

"The Conference

"*Recommends*

"1. that all governments establish, either singly or jointly, national committees on Vital and Health Statistics composed of representatives of administrations entrusted with the compilation of such statistics;

"2. that such national committees study broadly the problems of producing satisfactory national and international statistics in the field of Health;

"3. that these national committees also study the problems of producing Health Statistics which are related to the family structure and to the Social-Economic, and occupational background of the individual;

"4. that these national committees in tropical regions pay particular attention to the statistics needed for tropical diseases;

"5. that these national committees in countries facing the problems of population pressure and malnutrition pay particular attention to the statistics needed for these problems;

"6. that all national committees co-operate with schools of Medicine and Public Health so as to come to grips with the problems of Statistical Educatior and Training in the field of Vital and Health Sta tistics . . ."

When the World Health Organization was charge with the responsibility of fostering the creation of thes national committees, it was with the object of assignin 'o national technicians a number of statistical problem in vital and health statistics and of assisting in the co-ordination of statistical services within the country. Informative documents on the committees and their functions were issued, and a focal point was established at World Health Organization headquarters for maintaining relationships with the committees. In accordance with recommendations of the Expert Committee, the First International Conference of National Committees on Vital and Health Statistics was held in London from 12 to 17 October 1953 and, at that time, the objectives of the national committees were set forth as follows:[29]

"(*a*) To help in assessing the needs for vital and health statistics, in evaluating the degrees to which the needs are met and in providing the vital and health records and statistics satisfactory and useful to the

[28] Adopted in Resolution No. 9, entitled "Regarding National Committees on Vital and Health Statistics", by the Conference and endorsed by the First World Health Assembly (WHA1.36) during July 1948. (World Health Organization, document A3/83 Add. 1. Mimeo.) It was later endorsed also by the Second Inter-American Statistical Congress, assembled in Bogotá, Colombia, 16-27 January 1950 (Resolution 16).

[29] *Report on the First International Conference of National Committees on Vital and Health Statistics.* Document WHO-UN/Conf.Nat.Com./59, 16 November 1953. p. 8. Mimeo.

individuals and groups who use such records and statistics.

"(*b*) To help to achieve essential uniformity in records, methods, and tabulations for the production of the minimum core of comparable vital and health statistics needed for national or international purposes.

"(*c*) To assure a free flow of information and exchange of views, so that the needs and preferences of producers and users of vital and health records and statistics, at all levels, are given full expression and receive due consideration.

"(*d*) To relate the activities and functions of diverse agencies or organizations that produce statistics, so that they work as a co-ordinated whole, avoiding both wasteful overlapping of effort and important gaps in essential aspects of statistical data.

"(*e*) To make vital and health statistics of greater practical use and appeal.

"(*f*) To stimulate needed statistical studies by those persons or groups best able to undertake them.

"(*g*) To stimulate the training and supply of an adequate number of skilled workers in the field of vital and health statistics, and to encourage the interest of the medical profession in the value of the statistical approach in their problems.

"(*h*) To assist when desirable or necessary in the implementation of international recommendations in this field."

Among other papers presented at the Conference was one which set forth the status of organization of national committees in the various countries. According to this report,[30] committees had been established in 28 countries as of 30 September 1953. A number of countries have indicated that, in all likelihood, national committees will not be organized, because questions which fall within the purview of such committees are already dealt with by another type of arrangement.

Information on the aims of the official Committees and the programmes undertaken by some of them will be found in documents of the World Health Organization, Nos. A3/83 (12 May 1950), A3/83, Add.1 (15 May 1950), and Complementary Documents WHO/HS/Nat.Com./1-14, issued during the period 20 December 1950 to 29 June 1951. More recent information, together with evaluation of their function, appears in documents of the First International Conference of National Committees on Vital and Health Statistics, published as WHO-UN/Conf.Nat.Com./1-59.

Inter-agency committees, whether organized in response to the World Health Organization resolution or simply as mechanisms for co-ordination, should result in a common approach to the problems of co-ordination and the eventual elimination of duplicate operations within the vital-statistics system. However, one criticism which has been levelled at existing national committees is their tendency to concentrate membership and promotional activities in departments of government concerned primarily with health. Authorities in charge of population and those concerned with judicial procedures, and thus with registration and statistical reporting of divorces in many countries, are not fully represented. The following tabulation shows the frequency with which the various services are represented on the national committees on vital and health statistics in 26 countries:

Health services		74
Statistical services		45
Civil registration services		9
Social welfare (including hospitals)		23
Army		10
Foreign affairs		3
Education		2
Railways		2
Overseas territories		2
Police		2
Other ministries		7
Universities		30
Schools of medicine	8	
Schools of public health	8	
Other departments	14	
Private societies and associations		23
Not stated		10

It will be noted that the representation is not well balanced. Committees among these 26 vary in size from three to 21 members, the mode being eight. The general health services are represented on each of the 26 committees with a total of 74 representatives, compared with 45 from general statistical services in 23 countries. The civil registration system, which is the fundamental service involved, is formally represented on only nine of the 26 committees for which membership is known. Six of these nine committees are in Latin America, two in Asia, and only one (Spain) in Europe. The Ministry of Justice is represented on only one committee, that of France, despite the fact that it is frequently the ministry concerned with divorce records and statistics either alone or in collaboration with the registration service. Wherever population-census activities are in the central statistical office, they are, of course, represented if the statistical service or its equivalent is represented. However, in the United States of America, Uruguay, and Thailand, the general statistical service or census agency does not appear to have membership in the national committee. From this cursory examination, it would seem that in setting up national committees or in reconstituting those already established, attention should be paid to securing a broadly representative membership and to developing a programme which will synthesize these interests into an active committee.

2. Co-ordination at the operating level

A problem of co-ordination closely related to, and in fact part of, the maintenance of policy liaison between agencies concerned with the production and consumption of vital statistics is that of establishing and maintaining co-ordinated effort at the operating level. To guard against development of a duplicate system, it is necessary that the agency formally charged with the responsibility for vital statistics perform satisfactorily certain well-defined functions. It matters not whether this agency is the general statistical service, the health department, or the general register office; it must collect, tabulate, analyse, and publish vital statistics to the end that they meet national and international needs. Secondly, it must work continuously toward improvement of the completeness and accuracy of registration and statistical reporting.

[30] *Objectives, Programmes, Patterns of Organization and Fields of Activity of National Committees on Vital and Health Statistics in the Various Countries.* Document WHO-UN/Conf. Nat.Com./4, 30 September 1953. 73 p. Mimeo.

(a) *Uniform legislation and regulation*

Fundamentally, this type of internal co-ordination must have its origin in common aims and comparable methods of achieving these aims. The common aim is embodied in uniform basic legislation, accompanied by comparable legal interpretation. In countries where the national government can legislate for vital statistics, the uniformity of the laws and regulations is assured and interpretation may be controlled. In federated countries where a decentralized system operates, the achievement of uniformity in legislation must come through promotion of model laws for adaptation to local conditions by the constituent areas. Such was the history of vital statistics in Canada, for example, where model laws were suggested by the national government for adoption, suitably adapted, by the various provinces.

(b) *Work conferences*

The development of comparable methods for achieving the aims set forth in the basic legislation is another and distinct problem, the solution of which lies in quite another area. One effective method of achieving agreement between diverse groups is that of work conferences. Under a programme of work conferences, personnel engaged in the various aspects of the system are brought together periodically, either in regional or national meetings, to discuss the problems of producing vital statistics. The adoption of uniform procedures and definitions can be promoted, and experience in solving mutual problems can be exchanged. Rules and instructions for registrars and transcribers can be explained; methods of testing and evaluating the various facets of the system can be explored.

Some idea of the scope of work conferences of this type may be obtained from a review of the major areas of discussion included in the Fourth Annual Meeting of the Public Health Conference on Records and Statistics, sponsored by the United States Public Health Service and held in Washington, D.C., 25-28 March 1952. This Conference, which is a permanent organization that now brings together state registrars, vital statisticians, and other public-health statisticians, had its origin in the 1930 meetings of registrars with consultants from the federal vital statistics agency. It was finally organized as a Conference on 17 May 1949, with a broadened membership which included not only registrars but vital and public-health statisticians. The work of the Annual Meeting is carried out primarily by its two principal committees, one on registration, one on statistics, subdivided into "working groups". The major areas of discussion of these groups at the 1952 Conference were as follows:

1. Policy concerning the confidentiality of vital records
2. Notifiable disease and general illness statistics
3. Service statistics and programme registers
4. Mortality statistics (cause-of-death query programme and other means of improving medical certification)
5. Natality statistics (problems of foetal death reporting and tabulating)
6. Cost studies of vital records services
7. Marriage and divorce statistics
8. Model vital statistics law
9. Population statistics (problems of developing population estimates for small areas)
10. Registration practices (use of burial permits in connexion with registration)

The corresponding body in Canada is known as the Vital Statistics Council, at which representatives of the provinces and of Yukon and the Northwest Territories meet to discuss problems in the field of vital statistics. The agendas of the Council meetings are very similar to those of the United States Public Health Conference on Records and Statistics, inasmuch as the problems of vital statistics are similar from country to country.

(c) *Other means*

An information bulletin which disseminates information on new methods, codes, procedures, and so forth, may also be effective in advancing a programme of information interchange at the operating level. Yet another method of improving internal co-ordination is the provision of travelling consultants who will serve as liaison agents between headquarters and the field offices throughout the system. Such consultants may provide an effective method of achieving procedural co-ordination among decentralized operating units. All of these procedures for achieving co-ordination within the system will be discussed further in connexion with improving the work of the registrar, in chapter V.

3. Co-ordination between vital statistics and other closely related statistical fields

Vital statistics are closely related to several other fields of statistics, chief of which are population statistics, public-health statistics, migration statistics, statistics of social welfare, and medical statistics. This relationship is based primarily on the fact that all these fields of statistics deal with the status and certain characteristics of human beings. An event which happens to an individual is the statistical unit under consideration, that is, a birth, a death, a migration, an illness, an operation, a pension, and so forth. The need for co-ordination between statistical systems related in this way is obvious. The precise points at which co-ordination is required will be set forth below.

(a) *Statistics requiring co-ordination with vital statistics*

Population statistics. The statistical field which bears the most obvious relationship to vital statistics is that of population. For most analytical purposes, the frequency of occurrence of vital events must be related to an appropriate population base for the computation of rates. Rates for vital-statistics purposes are most often those in which the base or denominator of the rate should be the "population exposed to risk" of the event which constitutes the numerator. In order that the rate be valid, the "population exposed to risk" of the event under consideration should correspond to the vital statistics in terms of geographic coverage, type of population (i.e., "present" or "resident"), time reference, and charateristics or attributes. To achieve this detailed correspondence, great care has to be taken, first to ensure the comparable nature of the area units employed for tabulation and, second, to harmonize the definitions of terms and concepts used in obtaining the data as, for example, the definition of residence, age, marital status, occupation, industry, and so forth. Unless strict corre-

spondence of concept and definition is maintained between vital statistics and population at their origins, computation of meaningful rates will be difficult.

Correspondence between vital and population statistics should originate in the basic definitions, but it is equally necessary at the next stage of statistical processing, namely in the selection of classification schemes and the design of tabulation programmes. Even if all definitions were co-ordinated, dissimilar classifications or tabulations would invalidate direct relationships between vital statistics and population. This is particularly true in respect of geographic classifications, where failure to use similar geographic units can invalidate the comparison of vital and population data.

In general, the same or adaptable classification schemes should be employed in the tabulation of population data and vital statistics in order that the two types of data may be directly and accurately related. In this connexion, the use of international standard classification schemes or modifications of the same will be found most effective in maintaining strict comparability. The classifications recommended for use or adaptation will be set forth in chapter X.

In determining the specific points of relationship and the need for co-ordination between vital statistics and population, the place of the population register should not be overlooked. In this particular system, co-ordination needs to be maintained not only in definitions and procedures relating to the two fields but also between the form and content of the records used.

Inasmuch as changes in the population register are initiated in part through information obtained by means of vital records, basic record and filing procedures in the two systems should be co-ordinated in so far as is feasible to facilitate reference from one to the other. Fundamental definitions used in the two systems should be identical if possible or at least generally corresponding in order that information may be interchangeable between records. This latter point of interchangeability of information is important to ensure that data on one record can be used to complete or supplement those on another. In this way, unnecessary duplication of the collection function may be avoided or at least minimized.

In the matter of statistics derived from the population register as, for example, estimates of population, family statistics or those for households, there should be direct correspondence with the definitions and concepts employed in the field of vital statistics. Unless this type of co-ordination exists, the effectiveness of the population register as a tool for demographic research is to a large degree vitiated.

Public-health statistics. Another field of statistics related to vital statistics in a somewhat lesser degree than population is that of public-health statistics. "Public health", according to the Expert Committee on Public-Health Administration of the World Health Organization,[31] is "the science and art of preventing disease, prolonging life, and promoting mental and physical health and efficiency through organized community efforts for the sanitation of the environment, the control of communicable infections, the education of the individual in personal hygiene, the organization of medical and nursing services for the early diagnosis and preventive treatment of disease, and the development of social machinery to ensure to every individual a standard of living adequate for the maintenance of health, so organizing these benefits as to enable every citizen to realize his birthright of health and longevity". Public-health statistics, then, are those which are concerned with environmental sanitation, control of communicable disease, health education, medical care, morbidity, and certain aspects of social welfare. The interpretation of statistics in all of these fields is facilitated by reference to vital statistics. It is important, therefore, that definitions, procedures, classifications, and tabulations employed in the various fields be consistent.

Of particular importance from this viewpoint are statistics of morbidity which, irrespective of whether they have their source in routine notification of illnesses or in *ad hoc* or continuous surveys, are usually analysed both in relation to the population from which they arose and to the deaths which resulted from the specific morbid condition. The need for strict co-ordination between vital statistics and population has already been noted. The three-way relationship indicated between vital statistics, morbidity, and population demands a high degree of co-ordination at every stage. It was to emphasize such interrelationships that the Statistical Commission at its sixth session, while indicating its awareness of the need for the recommendations on classification schemes and tabulation programmes in the field of vital statistics, drew attention to the need for correlation and parallel development between vital statistics, migration statistics, and morbidity statistics with respect to coverage, definitions, and classifications.

Migration. As noted by the Statistical Commission, the field of migration statistics is also closely related to vital statistics. This field of statistics deals, as does vital statistics, with events occurring to human beings, in this case, changes of residence and domicile. The definitions, classifications, and tabulations developed for migration statistics should, therefore, correspond in so far as possible with those established for vital and population statistics.

Co-ordination of definitions and procedures between vital statistics and migration statistics is especially important with relation to their use in population estimates. In compiling estimates of population, statistics of immigration are analogous to those of birth, the two constituting additions to the population, while statistics of emigration correspond to deaths or deletions from the population. It will readily be seen that, in order to derive accurate population estimates, it is essential that the vital statistics and migration statistics be basically comparable in concept and, further, classified and tabulated in a manner which meets the needs of the population requirements. Co-ordinated development of the three fields is to be sought, therefore, in order that full use may be made of all available statistics.

Social welfare. Statistics of social welfare are here interpreted as including statistics of old-age-and-survivors insurance, hospitalization, pensions, benefits, housing, orphanhood, unemployment, and others from which may be developed statistics of families or house-

[31] Expert Committee on Public-Health Administration. First Report. (World Health Organization, *Technical report series*, No. 55. p. 5.)

holds. Statistics relating to any of these selected populations are usually analysed by comparing them to statistics of the general population. Such comparisons are facilitated if there is, within the pertinent fields of statistics, parallel development with respect to definitions, concepts, classifications, and tabulations.

Medical statistics. By medical statistics are meant those developed in connexion with evaluation studies and research in the field of medicine. The interpretation of statistics generated in this way is often facilitated, upon comparison with registration statistics of birth and death. Therefore, the methods and procedures for medical statistics should be co-ordinated in so far as possible with those for general vital statistics in order to facilitate the comparison and to render more useful the resulting medical statistics. This is particularly important with respect to definitions and classifications where correspondence is essential.

(b) *Method of co-ordinating related statistical fields*

The close co-ordination of method and procedure required to bring the statistics of population, public health, migration, social welfare, and medicine into correspondence with vital statistics may be achieved only by establishing close working relationships, especially at the technical level. At the time when plans are being laid for any of the series included in the above-mentioned statistical fields or when the modifications of procedures, scope, or tabulation are being considered, there would need to be a meeting of minds on the implications of the new or modified procedures. The adjustment of series to bring them into mutual correspondence is essential. Often this adjustment can be accomplished very simply; at other times, it may require major changes. But at all times, technical representatives of each statistical field involved should be consulted. A technical consultative committee to co-ordinate procedures, definitions, concepts, classifications, and tabulations will be found useful for this purpose.

CHAPTER IV

STATISTICAL DEFINITION OF EVENTS TO BE REGISTERED AND COUNTED

One of the major problems connected with vital statistics might be said to be the lack of comparability in defining the "units" of the system, that is, the events to be registered and counted, in such a way as to achieve comparability of statistics based on these units within and among countries. The definitions may differ in terminology only, or they may differ in matters of basic principle, which can invalidate international comparability.

Variation from country to country in the definitions of each of the vital events has led to international action in this field. In an attempt to increase uniformity and hence improve vital statistics, the United Nations Statistical Commission has recommended the use of certain definitions. These, together with their implications, will be discussed separately below.

A. Live birth

At first glance, it would seem relatively simple to define a live birth. All that is required is the establishment of a criterion for distinguishing it from a "dead birth" or "stillbirth". Theoretically, this objective should be able to be reached on the basis of "evidence of life". In spite of this apparent simplicity, however, live births have not been defined in a uniform manner throughout the world.

1. CURRENT INTERNATIONAL STANDARD DEFINITION

Recognizing the great importance of setting up uniform standards which might, by gaining wide acceptance and application, improve comparability of vital statistics, the Third World Health Assembly adopted a new definition of a live birth[1] in May 1950. The definition, which is given below, is the one recommended also by the Statistical Commission of the United Nations in *Principles for a Vital Statistics System.*[2] It reads as follows:

> "Live birth is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered live-born."

Together with this primarily medical definition, the World Health Assembly also adopted under the same Resolution (WHA3.6) a recommendation on "Registration and Tabulation of Live Births and Infant Deaths". This recommendation, which is designed to improve the completeness with which registration of live births takes place, specifies that "All live-born infants should be registered and counted as such irrespective of the period of gestation, and if they die at any time following birth they should also be registered and counted as deaths."

The medical nature of the international definition of live birth has given rise to objections in some countries — objections based on the often insurmountable juridical difficulty of incorporating the definition, in its present form, into vital registration legislation. But since the process of birth is a medical event, its definition will be in medical terms. It is expected that some modification of the terminology to meet national legal or statistical requirements will be necessary, but these need in no way impair the objectives of the standard definition. The entire definition is designed to ensure that, irrespective of its condition at the time of registration, *every product of conception which shows any sign of life after birth* shall be recorded in the live-birth register and subsequently counted in the live-birth statistics.

2. EVOLUTION AND PRESENT STATUS OF CURRENT STANDARD

The standard statistical concept of a live birth has, as noted above, two principal elements. First, it denominates as "liveborn" any product of conception which shows any sign of life. Secondly, it specifies that all such live-born infants should be registered and counted as such, irrespective of the duration of pregnancy or of life after birth. For purposes of the discussion which follows, the first of these elements may be termed the "evidence-of-life" criterion, and the second the "viability" criterion, which has medico-legal implications associated with the capacity of the newborn to live after birth. The evolution of the current standard definition in terms of these two elements will be set forth below.

(a) *Evidence-of-life criterion*

The evidence-of-life criterion with respect to a live birth has undergone several changes since it was first expressed, as early as 1590, by Henry Swinburne in his *Treatise on Wills,*[3] in which he wrote "crying

[1] Recommendation of the Subcommittee on the Definition of Stillbirth and Abortion of the World Health Organization Expert Committee on Health Statistics, at its first session in Paris, 27 February to 3 March 1950 (World Health Organization, *Technical report series,* No. 25. p. 12) which was adopted, as one of the recommendations under Article 23 of the Constitution and Article 17 of the "Regulations No. 1" of the World Health Organization, by the Third World Health Assembly, 19 May 1950. (WHA3.6) (World Health Organization, *Official Records,* No. 28. p. 16-17.)

[2] *Principles for a Vital Statistics System; Recommendations for the Improvement and Standardization of Vital Statistics.* United Nations. Statistical Office. Document ST/STAT/SER. M/19, 26 August 1953. p. 6. (Sales No. 1953.XVII.8)

[3] *Treatise on Wills;* a briefe treatise of testaments and last willes very profitable to be understood of all the subjects of this Realme of England . . . , by Henry Swinburne. Printed by J. Windet, London, 1590.

is not an only proof of life, since it may be proved by motion, breathing, and *such like"*, the "such like" being interpreted to cover heart beat. Conforming to this interpretation, English courts and, therefore, those of the United States of America and others which have their basis in English law, have always admitted heart beat as evidence of live birth. As noted in another connexion see p. 50), by Alfred Swaine Taylor in *Principles and Practice of Medical Jurisprudence,* "an English medical jurist has only to prove that there was some well-marked physiological sign of *life* after birth . . . "

English vital registration practice, which has its roots in civil law, has naturally followed this same criterion. Dudfield in a paper read before the Royal Statistical Society in 1905[4] noted that in England "Lawyers have not yet decided what constitutes live birth." But, by 1911, the Royal Statistical Society had appointed a Special Committee to inquire into "infant mortality" and, incidentally, stillbirths. The report of the Committee[5] recommended a stillbirth definition which made no mention of "breathing" but set forth cessation of heart function before birth as the criterion of stillbirth and, therefore, by inference, the presence of heart function as that of a live-born child. This criterion was subsequently used in the definition submitted by Dr. Dudfield for the consideration of the International Statistical Institute at its 1915 session (see p. 54), to which was added a "note"[6] reading as follows:

> "Crying and/or breathing — being secondary signs of life manifested only when the heart is acting — can be relied upon as signs of life but the absence of either or both is not to be held to be proof of the absence of life in the child."

Similarly, in the United States, the American Public Health Association in 1908 adopted a Rule of Statistical Practice,[7] which stated that "no child that shows any evidence of life after birth should be registered as a stillbirth". In 1913, the Association re-affirmed this Rule and added that the words "evidence of life" should include "action of heart, breathing, movement of voluntary muscle". These Rules were designed to help standardize registration practices among the various states, and they have persisted in one form or another to the present time. Thus, in England and the United States at least, "any sign of life" was early adopted as the criterion of a live birth.

"Any sign of life" did not become the universally accepted criterion, however, and in response to the demand for standardization with respect to this important factor, the League of Nations Health Committee in 1925 undertook a study of the problem. After analysing the various factors and their implications, the Committee[8] recommended the following definition as an international standard:

> ". . . the word 'birth' means the separation and extrusion of a foetus from the body of the parturient woman. The birth is to be deemed complete at the instant when the whole of the body of the foetus — head, trunk and limbs — is outside the body of the mother.
>
> "The birth is to be deemed a live-birth if, after birth (as defined above), the infant breathes.
>
> "The act of respiration is incontrovertible evidence of life, and its continued absence is to be taken as proof of foetal death."

It will be noted that this recommended definition is not the same as that established in the United States and England, because it recognizes not *"any sign of life"* but only *one sign* — breathing — as the criterion of a live birth. In explaining the basis for their recommendation, the League of Nations Committee pointed out that the desired criterion must be one which could be applied easily by a non-medical person, inasmuch as most births were not attended by medical personnel, and that the test of "breathing", in their opinion, was the most reliable and the easiest to recognize. Other evidence such as "heart beat" or "movement of muscle" might be overlooked even by a medical man, but even a lay person could not fail to notice breathing if it occurred. Hence, "breathing" alone was to be considered incontrovertible evidence of life and, conversely, its absence, proof of foetal death.

National practice. Following its promulgation, the League's definition was adopted by a number of countries until, by 1 January 1950 (just prior to the Third World Health Assembly's action), a total of 20 countries reported that they were employing the "breathing-only" criterion to distinguish a "live birth" from a "stillbirth". The identity of the 20 countries which in 1950 were adhering to the League's definition is shown in table 3 below. (In the absence of a specific live-birth definition, the data in table 3 are the reverse of the reported stillbirth definition.)

[4] "A Critical Examination of the Methods of Recording and Publishing Statistical Data Bearing on Public Health; with Suggestions for the Improvement of Such Methods" by Reginald Dudfield. *Journal of the Royal Statistical Society,* Vol. LXVIII, Part I, March 1905. p. 10.

[5] "Report of Special Committee on Infantile Mortality." *Journal of the Royal Statistical Society,* Vol. LXXVI (New Series), London, 1912-13. p. 27-87.

[6] "Still-births in Relation to Infantile Mortality" by Reginald Dudfield. *Bulletin de l'Institut International de Statistique,* Vol. XX, Part 2, Vienna, 1915. p. 146.

[7] Rule No. 19 of the "Rules of Statistical Practice" adopted by the Vital Statistics Section of the American Public Health Association at the Annual Meeting held in Winnipeg, Manitoba, August 1908.

[8] Report of the Committee Studying the Definition of Dead-Birth. League of Nations. Health Committee. C.M. 1925. C.224. M.80. Appendix 2. p. 78.

Table 3. Criteria for Registration as a Live Birth: 65 Countries, as of 1 January 1950

(An "X" indicates that the given criterion was used; a dash "—" indicates that it was not used; three dots ". . ." indicate that no information is available.)

Continent and country	Breathing	Other signs of life		Supplementary criteria		
		Any sign of life, i.e., action of heart, breathing, movement of voluntary muscles, or any other sign	*"Signs of life" (not specified in respect to breathing or to action of heart, etc.)*	*Survival for 24 hours*	*Alive at time of registration*	*Other*
AFRICA						
Egypt	—	—	X	—	—	—
Union of South Africa	—	—	X	—	—	—
AMERICA, NORTH						
Canada	X	—	—	—	—	—
Costa Rica	—	X	—	—	—	—
Cuba	—	—	—	X	—	Plus human appearance
Dominican Republic	X	—	—	—	—	—
El Salvador	—	X	—	—	—	—
Guatemala	X	—	—	—	—	—
Haiti	—	—	—	—	X	—
Honduras	—	X	—	—	—	—
Mexico	X	—	—	—	—	—
Nicaragua	X	—	—	—	—	—
Panama	—	X	—	—	—	—
United States	—	X	—	—	—	—
AMERICA, SOUTH						
Argentina	—	—	—	—	X	—
Bolivia	X	—	—	—	—	—
Brazil	—	—	X	—	—	—
Chile	X	—	—	—	—	—
Colombia	X	—	—	—	—	—
Ecuador	—	—	—	X	—	—
Paraguay	X	—	—	—	—	—
Peru	X	—	—	—	—	—
Uruguay	...	...	...	...	...	...
Venezuela	—	X	—	—	—	—
ASIA						
Burma	...	...	...	...	...	...
Ceylon	—	—	X	—	—	"Alive," i.e., not dead
India	X	—	—	—	—	—
Indonesia (European population)	—	—	—	—	X	—
Iran	—	—	—	—	X	—
Israel	X	—	—	—	—	—
Japan	—	—	X	—	—	—
Jordan	...	...	...	...	...	...
Lebanon	...	...	...	...	...	...
Pakistan	—	—	—	—	X	—
Philippines	—	X	—	—	—	Not "stillborn" and human features
Syria	—	—	—	—	X	—
Thailand	X	—	—	—	—	—
Turkey	X	—	—	—	—	—
EUROPE						
Austria	X	—	—	—	—	—
Belgium	—	—	—	—	X	Living at time of registration or returned as liveborn
Czechoslovakia	—	—	X	—	—	Not stillborn and weighing 400 grammes or more
Denmark	—	—	X	—	—	—
Finland	—	—	X	—	—	—
France	—	—	—	—	X	Plus human appearance
German Federal Republic	X	—	—	—	—	—

(Continued on following page)

Table 3. Criteria for Registration as a Live Birth: 65 Countries, as of 1 January 1950—*(Concluded)*

Continent and country	Breathing	Other signs of life		Supplementary criteria		
		Any sign of life, i.e., action of heart, breathing, movement of voluntary muscles, or any other sign	*"Signs of life" (not specified in respect to breathing or to action of heart, etc.)*	*Survival for 24 hours*	*Alive at time of registration*	*Other*
Greece	X	—	—	—	—	—
Iceland	—	—	X	—	—	Clear signs of life
Ireland	—	—	X	—	—	"Liveborn"
Italy	X	—	—	—	—	At least six months gestational age
Liechtenstein	—	—	X	—	—	"Liveborn"
Luxembourg	—	—	—	—	X	—
Monaco	...	...	...	...	...	...
Netherlands	—	—	—	—	X	—
Norway	—	—	X	—	—	—
Poland	—	—	X	—	—	—
Portugal	—	—	X	—	—	"With life"
Spain	—	—	—	X	—	—
Sweden	X	—	—	—	—	—
Switzerland	—	—	X	—	—	—
United Kingdom:						
England and Wales	—	X	—	—	—	—
Northern Ireland	—	X	—	—	—	—
Scotland	—	X	—	—	—	—
Yugoslavia	—	X	—	—	—	—
OCEANIA						
Australia:						
New South Wales (State)	X	—	—	—	—	—
New Zealand	—	X	—	—	—	—

It will be seen from table 3, however, that 27 out of the 60 reporting countries favoured the "any-sign-of-life" criterion. Thus, the present international standard appeared to be the practice in 1950 in a slight majority of the countries, and it is likely that in the future it will gain wider acceptance than its predecessor. In a provisional report made by the World Health Organization at the Conference of National Committees on Vital and Health Statistics in London, 12-17 October 1953[9] it is pointed out that, of 46 countries which answered a questionnaire on the subject, 23 had already adopted, or planned to adopt, the World Health Organization definition of live birth — either wholly or with slight modifications. The dates when these countries adopted the standard definition are given below:

Brazil	January	1950
Burma		1951
Costa Rica	January	1952
Dominican Republic		(no date)
Egypt		(no date)
Finland		(no date)
Haiti		(no date)
Iraq		(no date)
Israel	May	1953
Italy		1952
Japan		(no date)
Jordan	February	1950
Korea		1954
Mexico	January	1950
Netherlands		1950
New Zealand		1953
Norway		1954
Panama		1950
Thailand		1950
Turkey	January	1950
United States		1951
Venezuela	January	1951
Yugoslavia		1951

Effect of variation on statistics of live birth. In view of the fact that "any sign of life" is not yet universally accepted and that some 20 countries in 1950 still adhered to the "breathing-only" criterion for a live birth, it is necessary to ascertain the effect of this variation which will persist in earlier statistics of live birth, infant death, and foetal death, even after all countries adopt the new definition. The numerical difference between two series of birth statistics compiled according to these divergent definitions would consist of those infants which, in spite of exhibiting movement of voluntary muscle, heart beat, pulsation of cord, or the like, died before pulmonary respiration could be established. This group of infants is known to be small, and the effect of their inclusion or exclusion is not great, at least on live-birth statistics. In 1927, a Special Committee of the American Public Health Association showed by a study of 1,741 live births which occurred in the Boston Lying-In Hospital, that the use of breathing alone as evidence of life in place of the more comprehensive breathing, action of the heart, and movement of voluntary muscle would decrease the number

[9] *WHO Definitions of "Live Birth" and "Foetal Death"*. Document WHO-UN/Conf.Nat.Com./40, 30 September 1953. 12 p. Mimeo.

of live births recorded by only 0.4 per cent.[10] Thus, it will be seen that, although variation in the criterion used for evidence of life appears to be a major factor in the definition of a live birth, in actuality these differences in definition will have little effect on comparability of natality statistics.[11] For the effect of this source of variation on statistics of still birth, see p. 58.

(b) *Legal viability of newborn*

The current international standard definition of a live birth recommends that, once the evidence-of-life criterion has been applied, then every event defined thereby as a live birth should be registered and counted as such. It matters not that the newborn may die immediately after birth or, for example, that it may have had a gestation period of only five months, or that it might weigh only 300 grammes. Each and every product of conception which shows any sign of life — however briefly — should be registered and counted as liveborn, according to the standard definition.

However, in some countries there are certain legal requirements which prohibit the registration of all live-born infants as live births. These limitations have their origin in two types of requirements, (1) that an infant must be legally "viable", i.e., have shown that it can maintain life for a specified period of time, usually 24 hours, before it can acquire the civil rights of a citizen, conferred by registration as a live birth; and (2) that, being subject to verification by the registrar at that time, the condition of the newborn at the time of registration can be certified and recorded. In the latter case, a child born dead and one which died as much as three days or more after birth but before registration (before the event is made known to the registrar) will both be registered as "dead at registration" or stillborn. In so far as legal registration is concerned, it is not obligatory in such cases to distinguish those born dead from those who died after birth though prior to registration. However, provision is usually made to record such information for statistical purposes.

The practices described here will be found primarily in the statutes of countries in which the registration law had its origin in the Napoleonic Code, and they are in marked contrast to those which pertain under the English law. From *Principles and Practice of Medical Jurisprudence*[12] comes the following statement which clarifies the basic difference in the two concepts:

> "Viability — According to the English law, it is not necessary that a child, when born, should be capable of living, or *viable,* in order that it should take its civil rights. Thus it may be born at an early period of gestation; it may be immature and not likely to survive; or again, it may be born at the full period of gestation, but it may be obviously labouring under some defective organisation, or some mortal disease, which must necessarily cause its death within a short time after its birth. Fortunately, these points are of no importance in relation to the right of inheritance: an English medical jurist has only to prove that there was some well-marked physiological sign of *life* after birth ('Live Birth'); whether the child were mature or immature, diseased or healthy, are matters which do not at all enter into the investigation . . .
>
> "It may at first sight appear to be inconsistent with justice that a child which is born immature or labouring under disease, owing to which it cannot long survive its birth, should possess the same rights of inheritance as one which is born mature and perfectly healthy; but this evil to society is of far less magnitude than the adoption of a system which must constantly lead to subtle casuistical distinctions, and thereby create error and confusion. So long as there is no well-defined line between a child which is considered capable of living and one which is not, gross injustice must necessarily be inflicted by any rule of law similar to that which is admitted in the French Code."

National practice. According to information given in table 3, p. 48, Spain, Cuba, and Ecuador in 1950 required that the newborn child survive at least 24 hours before live-birth registration could be made. In addition, ten other countries required that the infant be alive at the time of birth registration. In order to clarify this "legal-viability" concept in connexion with live-birth registration and statistics in various countries, table 4 has been prepared to show for each country how infants born alive who die prior to completing 24 hours of life or prior to being entered in the birth register are recorded, and also the disposition of these births in the subsequent statistics.

Table 4 shows that in 12 countries, all live-born infants who die before registration or before 24 hours of age are registered not as live births and deaths, but as stillbirths. Cuba and Ecuador follow the same procedure as Spain, by which live-born infants are recorded as *abortos* if they fail to survive through 24 hours of life; in Argentina outside the capital, and in Haiti, Indonesia, Pakistan, Iran, Belgium, France, Luxembourg, and the Netherlands, infants who die before their birth is legally recorded, are registered as "stillbirths", which for all but Pakistan (Punjab) and Haiti means in the death register. In Argentina, Indonesia, Belgium, France, the Netherlands, Luxembourg, and Spain, provision is made for distinguishing true stillbirths from pseudo-stillbirths.

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[10] "Definition of Stillbirth" by Henry B. Hemenway, Chairman; William H. Davis; and Charles V. Chapin of the Committee to Consider the Proper Definition of Stillbirth. *American Journal of Public Health,* Vol. 18, No. 1, January 1928. p. 25-32.

[11] For a more current estimate of effect, see also *Report on the Definition of Stillbirth and Abortion,* by Dr. Percy Stocks (World Health Organization document No. WHO/HS/STDEF/4, 14 February 1950), in which it is estimated on data for England 1946-47, that the decrease would be 1.5 per cent in live births with a corresponding rise of 3 per cent in stillbirths.

[12] *Principles and Practice of Medical Jurisprudence,* by Alfred Swaine Taylor. 7th ed., rev. and brought up to date by Fred. J. Smith . . . London, Churchill, 1920. 2 vol. p. 45-46.

Table 4. Manner in Which Liveborn Infants Who Died Before Registration of Birth are Registered and Subsequently Reported for Statistical Purposes: 65 Countries, as of 1 January 1950

(An "X" indicates that the infant was registered and the occurrence tabulated as the given event; a dash "—" indicates that it was not; three dots "..." indicate that no information is available.)

Continent and country	*Liveborn infants who die before registration of birth*						
	Registered as			*Tabulated statistically as*			
	Live birth	*Death*	*Stillbirth*	*Live birth*	*Death*	*Stillbirth*	*Dead before registration*
AFRICA							
Egypt	X	X	—	X	X	—	—
Union of South Africa	X	X	—	X	X	—	—
AMERICA, NORTH							
Canada	X	X	—	X	X	—	—
Costa Rica	X	X	—	X	X	—	—
Cuba[1]	—	—	X	—	—	X	—
Dominican Republic	X	X	—	X	X	—	—
El Salvador	X	X	—	X	X	—	—
Guatemala[2]	X	X	—	X	X	—	—
Haiti[3]	—	—	X	—	—	X	—
Honduras[4]	X	X	—	X	X	—	—
Mexico	X	X	—	X	X	—	—
Nicaragua	X	X	—	X	X	—	—
Panama	X	X	—	X	X	—	—
United States	X	X	—	X	X	—	—
AMERICA, SOUTH							
Argentina	—	—	X[5]	X	X	—	—
Bolivia[6]	X	X	—	X	X	—	—
Brazil	X	X	—	X	X	—	—
Chile	X[7]	X	—	X[7]	X	—	—
Colombia[8]	X	X	—	X	X	—	—
Ecuador[1]	—	—	X[9]	—	—	X	—
Paraguay	X	X	—	X	X	—	—
Peru	X	X	—	X	X	—	—
Uruguay	X	X	—	X	X	—	—
Venezuela	X	X	—	X	X	—	—
ASIA							
Burma	X	X	—	X	X	—	—
Ceylon	X	X	—	X	X	—	—
India	X	X	—	X	X	—	—
Indonesia (European population)	—	—	X[5]	X	X	—	—
Iran	—	—	X	—	X	—	—
Israel	X	X	—	X	X	—	—
Japan	X	X	—	X	X	—	—
Jordan	...	...	...	...	...	...	...
Lebanon	X	X	—	X	X	—	—
Pakistan	—	—	X[9]	—	—	X	—
Philippines	X	X	—	X	X	—	—
Syria	—	X	—	—	X	—	—
Thailand	X	X	—	X	X	—	—
Turkey	X	X	—	X	X	—	—
EUROPE							
Austria	X	X	—	X	X	—	—
Belgium	—	—	X[5]	—	—	—	X
Czechoslovakia	X	X	—	X	X	—	—
Denmark	X	X	—	X	X	—	—
Finland	X	X	—	X	X	—	—
France	—	—	X[5]	—	—	—	X
German Federal Republic	X	X	—	X	X	—	—
Greece	X	X	—	X	X	—	—
Iceland	X	X	—	X	X	—	—

(Continued on following page)

Table 4. Manner in Which Liveborn Infants Who Died Before Registration of Birth are Registered and Subsequently Reported for Statistical Purposes: 65 Countries, as of 1 January 1950—*(Concluded)*

Continent and country	*Liveborn infants who die before registration of birth*						
	Registered as			*Tabulated statistically as*			
	Live birth	*Death*	*Stillbirth*	*Live birth*	*Death*	*Stillbirth*	*Dead before registration*
Ireland	X	X	—	X	X	—	—
Italy	X	X	—	X	X	—	—
Liechtenstein	...	...	...	...	...	...	...
Luxembourg	—	—	X[5]	X	X	—	—
Monaco	X	X	—	X	X	—	—
Netherlands	—	—	X[5]	X	X	—	—
Norway	X	X	—	X	X	—	—
Poland	X	X	—	X	X	—	—
Portugal	X	X	—	X	X	—	—
Spain[1]	—	—	X[5]	—	—	—	X
Sweden	X	X	—	X	X	—	—
Switzerland	X	X	—	X	X	—	—
United Kingdom:							
England and Wales	X	X	—	X	X	—	—
Northern Ireland	X	X	—	X	X	—	—
Scotland	X	X	—	X	X	—	—
Yugoslavia	X	X	—	X	X	—	—
OCEANIA							
Australia:							
New South Wales (State)	X	X	—	X	X	—	—
New Zealand	X	X	—	X	X	—	—

[1] Data refer to infants who die within 24 hours of birth, i.e., before they may be registered as a live birth, according to the law. After 24 hours of life, infant would be registered and counted as live birth and death.

[2] Prior to 1939, liveborn children dying before registration of birth were registered and counted as stillbirths.

[3] In civil register. In hospitals, registered as live birth and death.

[4] Prior to revision in 1953 of series for 1926-1951, liveborn infants who did not survive 24 hours were registered and counted as stillbirths.

[5] Registered with true stillbirths in the death register with note "dead before registration" (except in Buenos Aires, where normal registration as live birth and death prevails).

[6] Prior to 1948, liveborn infants who failed to survive 24 hours were registered and counted as stillbirths.

[7] Obligation of registrar to enter a corresponding birth registration for infants dying before registration of birth extends only to those who have not completed more than 30 days of age.

[8] In practice, statistics are derived not from civil register but from ecclesiastical registers of baptisms and from registers of burial permits. Tabulation, therefore, is determined by practices employed in these registers rather than by civil procedures.

[9] Entered in the death register with a marginal note "stillbirth".

It should be emphasized that this presentation reflects the regulations in effect and not necessarily current practice. The extent of the success or failure to make the necessary marginal notations which distinguish liveborn from stillborn or dead when they are recorded in the same register, cannot easily be measured. Similarly, it should be noted that some countries which appear to have a clear distinction between liveborn and stillborn are also those in which medical attendance at birth is not the general rule. In such countries, it is difficult — if not impossible — for the lay informant to certify to the registrar that the infant was actually born dead, rather than born alive, and died shortly after birth. In order that a burial permit may be obtained, all such cases are normally recorded in the death register, but the preparation of the corresponding live-birth registration does not always follow. As a matter of fact, some countries specifically excuse the registrar from making the appropriate entry in the live-birth register unless it precedes the death registration. The effects of this practice on the under-registration of live births are, of course, difficult to measure.

Effect of variations on statistics of live birth. The effect of these legal variations on vital statistics is not as great as might be anticipated. Most of the countries in which registration is dependent upon the survival of the child until the time of registration also make provision to distinguish the liveborn who died before registration from true foetal deaths. Thus, in the Netherlands, Belgium, Luxembourg, Spain, and France, most statistics of live birth for recent years can now be compared validly with those of other countries.

The potential effect of this divergent registration practice on statistics for past years may be estimated from data for France which show that the infants born alive who died before registration and were, therefore, recorded as *présentés sans vie* constituted 18 per cent of the total *présentés sans vie*. Thus, their deletion from the count of "stillbirths" would materially reduce the stillbirth rate; but the deficiency in live-birth statistics caused by the omission of these births is naturally of a much smaller magnitude, being in the neighbourhood of 0.5 per cent of total live births in 1950. For Belgium,

the comparable ratio would have been 1 per cent in 1952, and for Spain 0.2 per cent in 1950; so it is clear that in respect of live-birth statistics, the variations due to this factor are negligible.

The foregoing has dealt with the problem of "legal viability" as a criterion of live-birth registration. There is, in addition, the slightly different case wherein a requirement of "viability" is applied through supplementary criteria such as weight (400 grammes in Czechoslovakia) and period of gestation (six months in Italy). In these cases, a foetus showing signs of life but of such small weight or gestational age that its chances of survival are thought to be very slight is considered as stillborn. Actually, the effect of the omission of these relatively few cases from live-birth statistics also would be negligible. There are no extensive statistics with which to evaluate the effect, but studies of selected live births by birth weight and by period of gestation might throw some light on the magnitude of the problem. A study of survival according to birth weight in five hospitals and the London County Council area in Great Britain, reported by Dr. Percy Stocks,[13] shows that out of 19,000 single births, only 14 with a birth weight of two pounds or less were liveborn, and none of them survived as long as seven days.

The frequency of live births at low gestation periods is exemplified by these same data. Out of the 19,000 single births, there were five live births with a gestation period of 20-23 completed weeks and, of these, three did not survive even one day, while the other two lived one week. Of those with a 24-27-week gestational age, 34 were liveborn and eight survived for one week. Thus, it will be seen that the effect of establishing a live-birth criterion of weight or gestational age at the lower end of the scale is not important from a statistical viewpoint.

3. Summary

In summary, it may be said that desirable as it would be to have uniform registration practices with respect to live births, the most important consideration from the statistical point of view is to provide for a clear line of tabulation demarcation between live births and stillbirths (foetal deaths) and to establish rules for statistical reporting which will render the resulting statistics comparable. According to information in tables 3 and 4, means to achieve comparability are already at hand, but the implementation of these provisions requires strict adherence to the established procedure for reporting.

B. Death

1. Current international standard

Because of its incontrovertible nature, less difficulty exists with respect to the definition of a death than with that of a live birth. For purposes of medicine and physiology, various definitions have been used from time to time. However, a "statistical" definition is obviously required in order to designate the events to be registered as "deaths" and, therefore, those to be counted in mortality statistics. No international statistical recommendation was made until the Statistical Commission of the United Nations in 1953 proposed the following in the *Principles for a Vital Statistics System*:[14]

> "Death is the permanent disappearance of all evidence of life at any time after live birth has taken place (post-natal cessation of vital functions without capability of resuscitation). This definition therefore excludes foetal deaths."

Unlike the live-birth or foetal-death definition, this definition of a death does not aim to provide criteria for medical purposes, but to provide the registration official and the statistician with a definition which makes clear the distinction between post-natal and prenatal or foetal deaths.

2. National practice

No detailed information is available as to the adherence or lack of adherence of countries to this definition of death. The only information which is available is set forth in table 4, p. 51, where it is shown that in some countries, live-born infants who die before registration of birth or before 24 hours of age are registered not as live births and deaths but as stillbirths. Thus, a small number of post-natal deaths in such countries are not considered as deaths in the sense of the above definition.

3. Effect of variations on statistics of death

When infants born alive but dying before registration of birth or before 24 hours of age are registered as stillbirths rather than as deaths, provision is sometimes made at the tabulation level to add them to the count of deaths. However, even when such provision is lacking, it should be emphasized that the effect of the exclusion from death statistics of this particular group of deaths is not great. Pascua[15] has estimated for Belgium in 1930 that this group amounts to only about 1 per cent of total deaths, which is a small factor with respect to general mortality. In the case of infant mortality, the situation is somewhat different, since a potential understatement of about 6 per cent may result.

A second source of variation is based on procedure rather than on definition. When stillbirths (or foetal deaths) are registered according to death-registration provisions, i.e., in the death register, some may be inadvertently included in the death statistics. Such an eventuality does not entirely invalidate mortality statistics, although the error could be appreciable and certain relationships could be obscured.

C. Stillbirth

The statistical definition of a "stillbirth" has traditionally rested on two criteria — one to distinguish it from a live birth and one to segregate it from what has been known variously as an "abortion" or a "miscarriage". The factor which distinguishes the stillbirth from the live birth is, of course, the "evidence-of-life" criterion discussed at length under section A above. At the other end of the scale is the second element — the criterion of "physical viability" which

[13] *Report on the Definition of Stillbirth and Abortion, op. cit.*

[14] *Principles for a Vital Statistics System, op. cit.* p. 6.

[15] "Diversity of Stillbirth Definitions and Some Statistical Repercussions" by M. Pascua. *WHO Epidemiological and Vital Statistics Report*, Vol. 1, No. 10, March 1948. p. 220-221.

distinguishes stillbirths from "abortions" and which is part of the current international standard definition.

1. Current international standard definition of stillbirth

The World Health Organization Subcommittee on Definition of Stillbirth and Abortion has defined a stillbirth as a "late foetal death" or the death prior to complete expulsion or extraction from its mother of a product of conception which has attained 28 or more completed weeks of gestation;[16] the death is indicated by the fact that after such separation, the foetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles.

This definition, which was adopted in the United Nations *Principles for a Vital Statistics System*,[17] focuses attention at once upon one of the criteria which has given rise to the greatest divergence of opinion among countries, that is, the evidence required to distinguish a "stillbirth" from an "abortion" or, more correctly, the "minimum-period-of-gestation" criterion. This factor, which is customarily known as the "physical viability" criterion, has to do with the ability of a foetus to be born alive, but not necessarily to survive. The other element of the definition is the absence-of-life criterion which distinguishes the stillbirth from the live birth. These will both be discussed below.

2. Evolution and present status of current standard

(a) *Physical viability*

The desirability of distinguishing between an "abortion" and a "stillbirth" by establishing a minimum period of utero-gestation to define "viability" (in the sense of being capable of being born alive) was discussed in great detail as early as 1912 by the Special Committee on Infantile Mortality referred to previously.[18] In their Report, the Committee noted that

> "A foetus may be born alive but be incapable of independent existence. A child (or foetus) born in such a condition is not worth considering as an addition to the population and has no interest to the statistician except he be dealing with problems of 'complete' human fertility. It is necessary, therefore, to decide after what period of uterogestation a foetus may be expected, as a rule, to emerge in a viable condition, *i.e.*, capable of independent existence. Common experience teaches that a foetus 'born' before the conclusion of the fifth month of gestation rarely lives more than a few minutes, that a foetus born during the next ensuing month can be reared, but with great difficulty, but from the end of that month onwards the chance of survival steadily improves."

The Committee, therefore, came to the conclusion that a still-born child means a child born dead after a period of gestation of not less than seven lunar months (28 weeks).

When this definition was presented to the Royal Statistical Society for consideration, Dr. Dudfield[19] pointed out that the Council of the Obstetrical Section of the Royal Society of Medicine had recommended length of foetus as a substitute for period of uterine gestation. He, therefore, proposed to amend the definition drafted by the Committee so that it would read as follows:

> "A 'still-born child' means a child whose body at birth measures not less than 13 inches (32 centimetres) in length from the crown of the head to the sole of the heel, and who, when completely born (the head, body and limbs of the child, but not necessarily the afterbirth, being extruded from the body of the mother), exhibits no sign of life — that is to say, whose heart has ceased to function, as demonstrated by the absence of pulsation in the cord at its attachment to the body of the child and absence of any heart-sounds or impulses."

He noted that "with such a standard anyone possessing common sense and a yard measure would be able to decide whether the dead foetus was to be held to be a still-born child or not". This definition was subsequently presented for consideration to the International Statistical Institute at its 1915 session.[20]

The problem of an international definition was considered by a Committee of the League of Nations,[21] which in 1925 promulgated the following standard:

> "It is desirable, for statistical purposes, that a distinction should be made between the birth of a foetus which can normally be expected to be capable of an existence independent of its mother and the expulsion of one which cannot, births in the latter category being regarded as miscarriages (abortions).
>
> "A foetus capable of an independent existence is a 'viable foetus' and is the product of a gestation which has lasted at least twenty-eight weeks. Such foetus will normally measure at least 35 cm. from the crown of the head to the sole of the heel, the body being fully extended. We [The Committee] are of opinion that the latter criterion is the more trustworthy."

National practice. It will be interesting to see the extent to which the various countries of the world have accepted and adopted the viability criterion of the international definitions formulated by the International Statistical Institute and the League of Nations. In annex 3 beginning on p. 230, will be found verbatim statements of the definitions of "stillbirth" in use in 84 countries as of 1 January 1950, and in table 5 the elements of these definitions set out in tabular form.

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[16] World Health Organization, *Technical report series*, No. 25, p. 12-14.

[17] *Principles for a Vital Statistics System, op. cit.* p. 7.

[18] "Report of Special Committee on Infantile Mortality", *op. cit.*

[19] "Still-Births in Relation to Infantile Mortality" by Reginald Dudfield. *Journal of the Royal Statistical Society*, Vol. LXXVI (New Series), London, 1912-13. p. 1-16.

[20] "Still-births in Relation to Infantile Mortality" by Reginald Dudfield. *Bulletin de l'Institut International de Statistique*, Vol. XX, Part 2, Vienna, 1915. p. 139-148.

[21] Report of the Committee Studying the Definition of Dead-Birth, *op. cit.* Appendix 2. p. 78.

Table 5. Definition of a Stillbirth in Terms of "Viability" and of "Signs of Life": 65 Countries, as of 1 January 1950

(For verbatim definitions, see annex 3, p. 230. An "X" indicates that the definition included the given criterion; a dash "—" indicates that it did not; three dots "..." indicate that no information is available.)

Continent and country	*Criterion of physical viability (abortion versus stillbirth)*										*"Signs-of-life" criterion (stillbirth versus live birth)*				
					Minimum period of gestation							*Absence of any "sign of life"*		*Legal viability*	
					Weeks		*Months*								
	Recognizable as human being	*"Viable"*	*Minimum length of 35 cm. or 14 in.*	*Minimum weight*	*20*	*28*	*4*	*5*	*6*	*7*	*Absence of breathing*	*Beating of heart, breathing, movement of voluntary muscles*	*Unspecified*	*Absence of life at registration*	*Failure to survive 24 hours*
AFRICA															
Egypt	—	—	—	—	—	—	—	—	X	—	—	—	X	—	—
Union of South Africa	—	X	—	—	—	—	—	—	—	—	—	—	X	—	—
AMERICA, NORTH															
Canada[1]	—	—	—	—	—	X	—	—	—	—	X	—	—	—	—
Costa Rica	—	—	—	—	—	X	—	—	—	—	—	X	—	—	—
Cuba	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X
Dominican Republic	—	—	—	—	—	X	—	—	—	—	X	—	—	—	—
El Salvador[1]	—	—	—	—	—	X	—	—	X	—	—	X	—	—	—
Guatemala	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—
Haiti	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Honduras[1]	—	—	—	—	—	X	—	—	—	X	—	X	—	—	—
Mexico	—	X	—	—	—	—	—	—	—	—	X	—	—	—	—
Nicaragua[1]	—	—	—	—	—	X	—	—	—	X	X	—	—	—	—
Panama	—	—	—	—	—	—	—	X	—	—	—	X	—	—	—
United States[2]	—	—	—	—	X[3]	—	—	—	—	—	—	X	—	—	—
AMERICA, SOUTH															
Argentina	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—
Bolivia	—	—	—	—	—	X	—	—	—	—	X	—	—	—	—
Brazil[1]	—	—	—	—	—	X	—	—	—	—	X	—	—	—	—
Chile[1]	—	—	—	—	—	X	—	—	—	—	X	—	—	—	—
Colombia[1]	—	—	—	—	—	—	—	—	X	—	X	—	—	—	—
Ecuador[1]	—	—	—	—	—	X	—	—	—	—	X	—	—	—	X
Paraguay	—	—	—	—	—	X	—	—	—	—	X	—	—	—	—
Peru[1]	—	—	—	—	—	X	—	—	—	—	X	—	—	—	—
Uruguay	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Venezuela	—	—	—	—	—	—	—	—	X	—	—	X	—	—	—
ASIA															
Burma	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ceylon	—	—	—	—	—	X	—	—	—	—	—	—	X	—	—
India[4]	—	—	—	—	—	X	—	—	—	—	X	—	—	—	—

(Continued on following page)

Table 5. Definition of a Stillbirth in Terms of "Viability" and of "Signs of Life": 65 Countries, as of 1 January 1950—*(Continued)*

Continent and country	*Criterion of physical viability (abortion versus stillbirth)*										*"Signs-of-life" criterion (stillbirth versus live birth)*				
					Minimum period of gestation							*Absence of any "sign of life"*		*Legal viability*	
					Weeks		*Months*								
	Recognizable as human being	*"Viable"*	*Minimum length of 35 cm. or 14 in.*	*Minimum weight*	*20*	*28*	*4*	*5*	*6*	*7*	*Absence of breathing*	*Beating of heart, breathing, movement of voluntary muscles*	*Unspecified*	*Absence of life at registration*	*Failure to survive 24 hours*
Indonesia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Iran	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Israel	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—
Japan	—	—	—	—	—	—	X[3]	—	—	—	—	—	X[5]	—	—
Jordan[6]	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lebanon[6]	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pakistan	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Philippines	—	—	—	—	—	—	X[3]	—	—	—	—	X	—	—	—
Syria[6]	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Thailand	—	—	—	—	—	X	—	—	—	—	X	—	—	—	—
Turkey[1]	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—
EUROPE															
Austria	—	—	X	—	—	—	—	—	—	—	X	—	—	—	—
Belgium	—	—	—	—	—	—	—	—	X[7]	—	—	—	—	X[8]	—
Czechoslovakia	—	—	—	X[9]	—	—	—	—	—	—	—	—	X[5]	—	—
Denmark	—	—	—	—	—	X	—	—	—	—	—	—	X	—	—
Finland	—	—	—	—	—	—	—	—	X	—	—	—	X	—	—
France	X	—	—	—	—	—	—	—	X[10]	—	X	—	—	X[8]	—
German Federal Republic	—	—	X	—	—	—	—	—	—	—	X	—	—	—	—
Greece	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—
Iceland	—	—	—	—	—	X[11]	—	—	X[11]	—	—	—	X	—	—
Ireland[6]	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Italy	—	—	—	—	—	—	—	—	X	—	X	—	—	—	—
Liechtenstein	—	—	—	—	—	—	—	—	X	—	—	—	X[5]	—	—
Luxembourg	—	—	—	—	—	—	—	—	—	—	—	—	X[5]	X	—
Monaco	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Netherlands[1]	—	—	X	—	—	X	—	—	—	—	—	X	—	X	—
Norway	—	—	—	—	—	X	—	—	—	—	—	—	X	—	—
Poland	—	—	—	—	—	—	—	—	—	X	—	—	X	—	—
Portugal	X	—	—	—	—	—	—	—	—	—	—	—	X	—	—
Spain	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X[8]
Sweden	—	—	X	—	—	—	—	—	—	—	X	—	—	—	—
Switzerland	—	—	X[12]	—	—	—	—	—	—	—	—	—	X	—	—
United Kingdom:															
England and Wales	—	—	—	—	—	X	—	—	—	—	—	X	—	—	—
Northern Ireland[6]	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scotland	—	—	—	—	—	X	—	—	—	—	—	X	—	—	—
Yugoslavia	—	—	—	—	—	X	—	—	—	X	—	X	—	—	—

(Continued on following page)

Table 5. Definition of a Stillbirth in Terms of "Viability" and of "Signs of Life": 65 Countries, as 1 January 1950—*(Concluded)*

Continent and country	*Criterion of physical viability (abortion versus stillbirth)*										*"Signs-of-life" criterion (stillbirth versus live birth)*				
					Minimum period of gestation							*Absence of any "sign of life"*		*Legal viability*	
					Weeks		*Months*								
	Recognizable as human being	*"Viable"*	*Minimum length of 35cm. or 14 in.*	*Minimum weight*	*20*	*28*	*4*	*5*	*6*	*7*	*Absence of breathing*	*Beating of heart, breathing, movement of voluntary muscles*	*Unspecified*	*Absence of life at registration*	*Failure to survive 24 hours*
OCEANIA															
Australia:[13]															
New South Wales (State)	—	—	X	—	—	X	—	—	—	—	X	—	—	—	—
New Zealand	—	—	—	—	—	X	—	—	—	—	—	X	—	—	—

[1] Definition as adopted for statistical purposes; in El Salvador, Honduras, and Colombia, registration of stillbirths is not compulsory but statistics are obtained from burial permits, etc.

[2] Definition used by the National Office of Vital Statistics prior to the adoption of the World Health Organization's recommended definition of foetal deaths (1951). The definition of stillbirth with regard to length of gestation varies from state to state, but comparable statistics are obtained by uniform tabulation.

[3] "Reached 20th week" for the United States; "over 3½ months" for Japan; "attained 5th month" for Philippines.

[4] Definition as adopted by the Director-General of Health Statistics. Definition varies from state to state (see annex 3).

[5] Defined only as "stillborn", "stillbirth", "without life".

[6] No definition available. Registration of stillbirths is not compulsory, and statistics are not compiled.

[7] After the 180th day of gestation.

[8] Although all are included with "born dead" and "died during delivery", the number in each category is tabulated separately. See table 4.

[9] More than 400 grammes.

[10] In Paris, more than four months.

[11] After six and one half months (28 weeks).

[12] Thirty centimetres.

[13] Definition varies from state to state, the information given here referring to New South Wales. See annex 3 for additional information.

According to table 5, viability was expressed in terms of minimum period of gestation, minimum length of foetus, minimum weight of foetus, and also by appearance of the foetus, that is, "recognizable as a human being". By far the majority, or 37 out of 53 reporting countries, used "minimum period of gestation", but among this group, there is lack of agreement as to the exact length of the utero-gestation period which should be used to distinguish a "viable" foetus from a "non-viable" one. It will be seen from table 5 that Japan believed a foetus might be "viable" at three completed months of pregnancy, the lowest duration recognized as implying viability. Prior to the adoption of the World Health Organization's definition in 1951, the "Model Law" of the United States of America required "advanced to 20th week", although, among the 48 states of the United States, the criterion varies from at least four and a half months to after not less than 28 weeks. Among the other countries for which data are available, one finds that Panama specified at least five months, nine countries required six months, and 25 countries were in agreement with the League recommendation of 28 weeks or seven lunar months.

It will be noted that in interpreting the national definitions cited above, for convenience of grouping, the weeks have been equated to lunar months of 28 days. But in actual practice, there is no way of knowing how the definitions are understood by the medical attendants or the registrars who apply them. One attendant may interpret the definition in terms of lunar months; another will use a calendar-month scale. Further, one registrar may interpret the period specified in the definition in the ordinal sense rather than as a completed period. Moreover, the point of origin of the gestational period may be taken as the beginning of the last menstruation prior to pregnancy, or it may be defined as the time elapsed since the probable conception date, which is usually thought to be 10-14 days later. All of these factors affect the "minimum-period-of-gestation" criterion of a stillbirth, and the extent of the variability which may occur with respect to this one criterion can be appreciated by the complexity of the factors.

Effect of variation on statistics of stillbirth. Disregarding for the moment the interpretive variations described above, it may be interesting to determine if possible what effect, if any, the varying minimal gestational ages might have on statistics of "stillbirth". Very little statistical evidence is available, because stillbirth statistics in most countries have referred only to the group falling within the limits of the different definitions. However, there are some data for foetal deaths in New York City which might throw light on the effect of this factor. Beginning in 1939, the City of New York has required the reporting of all products of gestation, irrespective of the period of gestation.[22] The number of foetal deaths reported has risen steadily since that time, reaching 16,372 in 1950 (though even this number is thought to represent only about 50 per cent of the total foetal deaths actually occurring). When these 16,000 foetal deaths are distributed by period of gestation, the following distribution is found:[23]

Under 16 weeks	10,777
16-19 weeks	1,440
20-23 weeks	899
24-27 weeks	440
28 weeks and over	2,325
Not stated	491
All gestational periods	16,372

From this distribution will be seen first the interesting fact that 77 per cent of the foetal deaths reported in New York City in 1950 had a gestational age of under 20 weeks. If, according to the previous standard United States definition, only foetal deaths of 20 or more weeks of gestation had been reported as "stillbirths", the total reported would have been 3,664 (excluding the "not stated" group). If the minimum gestation period were raised from 20 to 24 weeks, 899 "stillbirths" or 24.5 per cent of the 3,664 would have been excluded. Raising the lower limit to 28 weeks (the League recommendation) would decrease the number of "stillbirths" reported by another 12 per cent. It will be clear from these data that the variation in the criterion of physical viability, as measured by utero-gestational age, would introduce sizable differences into statistics of stillbirth and, in fact, render them almost completely non-comparable.

(b) *Absence of evidence of life*

In connexion with the international definition of a live birth, it was pointed out that two criteria are usually relied upon to distinguish the still-born from the live-born foetus, namely "evidence of life" and a medico-legal factor which was referred to as "legal viability of the newborn". Of these, the evidence-of-life criterion is by far the more important because, as noted above, the effect of the medico-legal factor is eliminated by statistical reporting rules in almost every country where it might have an effect on statistics.

The history of the evidence-of-life criterion was outlined on p. 46 ff. above. There, it was shown that, in terms of this criterion, two types of definitions exist: one specifies "breathing" as the sole acceptable evidence of life and, therefore, absence of breathing as proof of a stillbirth; the other accepts "any sign of life" as evidence of a live birth or, conversely, the absence of all or specified signs as evidence of a stillbirth.

Dependence on absence of *a sign other than breathing* has been the choice of several bodies which have deliberated this problem. For example, the Royal Statistical Society, in the Report of its Committee,[24] made no reference to absence of breathing but gave as the sole acceptable evidence of a stillbirth one "whose heart has ceased to function before the whole of the body . . . of such child has been completely extruded from the body of the mother". A draft definition, developed from the work of the Committee mentioned

[22] "The Inadequacy of Routine Reporting of Fetal Deaths as Evidenced by a Comparison of Such Reporting with Maternity Cases Paid for under the Emergency Maternity and Infant Care (EMIC) Program" by Leona Baumgartner, Helen M. Wallace, Eva Landsberg, and Vivian Pessin. *American Journal of Public Health*, Vol. 39, No. 12, December 1949. p. 1549-1552.

[23] *Fetal Death Statistics, United States, 1950.* Department of Health, Education, and Welfare. Public Health Service. National Office of Vital Statistics. Vital Statistics — Special Reports. National Summaries. Vol. 37, No. 17, Washington, 2 February 1954. p. 437.

[24] "Report of Special Committee on Infantile Mortality", *op. cit.* p. 42.

above and proposed for adoption by the International Statistical Institute[25] in 1913, also made no mention of breathing but was based on "absence of pulsations in the cord . . . and absence of any heart sounds or impulses". Both of these definitions were predicated on the sound idea that beating of the heart is the physiological predecessor of breathing or any other sign, and its absence is incontrovertible evidence of death. Absence of crying and/or breathing, on the other hand, is not held to be proof of absence of life in the child.

In spite of the soundness of this concept, the Health Organisation of the League of Nations in 1925 set forth the recommendation for the definition of a live birth, which required that the infant *breathe* to be considered a live birth, and defined a stillbirth,[26] as follows:

> ". . . a 'dead-birth' is the birth of a foetus, after twenty-eight weeks' pregnancy, in which pulmonary respiration does not occur; such a foetus may die either: (a) before, (b) during, or (c) after birth, but before it has breathed".

This proposal gave rise to a great deal of criticism, among which was that of the American Public Health Association[27] which noted that the recommended definition contained two very distinct propositions — (1) that breathing shall be the only acceptable evidence of life to distinguish a live birth from a dead birth, and (2) the desirability of establishing a minimum period of utero-gestation to indicate "viability" of the foetus.

National practice. The extent to which in 1950 the various countries had adhered to or rejected the League of Nations definition was set forth in table 5, and the effect of variation in the utero-gestation period chosen as a minimum has been discussed above. In respect of the other criterion of the definition, i.e., the absence of evidence of life which distinguishes the stillbirth from the live birth, it will be seen from table 5 that, in 1950, 23 countries were using the absence of breathing as the proof of a stillbirth, while an almost equal number, 27, employed absence of any sign of life including beating of heart, breathing, etc. It will be noted that the elements of the definition of stillbirths are not always the exact reverse of the live-birth definitions presented in table 3, although in most cases they are assumed to be so.

Effect of variation on statistics of stillbirth. It was pointed out in connexion with the live-birth definition that the effect of using breathing alone or any sign of life had very little effect on the statistics of natality. The effect on foetal mortality is somewhat greater, however. The authors of the American study mentioned above[28] have estimated that application of the "absence-of-breathing" criterion would increase the frequency of stillbirths by 1.5 per cent. Percy Stocks[29] has estimated on data for England 1946-47 that the number of stillbirths would be increased by 3 per cent if absence of breathing were the sole criterion for a stillbirth. The effect on infant deaths is estimated to be a decrease of 0.8 per cent.

(c) *Legal viability of the newborn and effect on statistics of stillbirth*

The medico-legal systems in the various countries whereby life, if not sustained for 24 hours, is considered not to have existed or whereby the condition of the child (i.e., dead or alive) at the moment of registration is the information registered, also raise problems of comparability in respect of stillbirth or foetal-death statistics.

As noted above in connexion with live birth, the effect of these non-uniform definitions would be considerable were it not for the fact that in most countries where this type of legal provision prevails, statistical tabulating procedures make it possible to correct the statistics. The potential effect of this factor and its effect on unadjusted series may be obtained by studying the statistics of some of the countries shown in table 4. Using statistics for Belgium 1921-1930, M. Pascua[30] showed that the stillbirth ratio could be overstated 17 to 23 per cent by including with true stillbirths infants born alive but dead at registration. In using historical series of stillbirth statistics for these countries, care must be taken to ensure that adjustment has been made for this potential overstatement.

D. Foetal death

1. Current international standard definition of foetal death

The wide variation in the minimum period of gestation adopted by the individual countries to define a stillbirth, and the lack of uniformity in the matter of a standard for evidence of life or its absence, pointed to the inadequacy of the international standard promulgated by the League and led to a reconsideration of the entire question. The World Health Organization Expert Committee on Health Statistics took the problem of definition under advisement at its first meeting in May 1949, at which time a Subcommittee on the Definition of Stillbirth and Abortion was set up.

The Subcommittee, after detailed consideration and with the advice of medical experts, proposed to the Expert Committee that "foetal death", which is any product of gestation, rather than a "stillbirth" (a product of 28 completed weeks of gestation), should be defined and that only the foetus which lacked a sign of life should be classed as a foetal death. Thus, all foetuses showing *any sign of life* would be recorded as "liveborn". The Expert Committee adopted the recommendation of the Subcommittee at its second session in April 1950; the Third World Health Assembly approved it in 1950; the United Nations Statistical Commission adopted it in the *Principles for a Vital Statistics System* in February 1953.

[25] "Still-Births in Relation to Infantile Mortality" by Reginald Dudfield. *Bulletin de l'Institut International de Statistique*, Vol. XX, Part 2, Vienna, 1915. p. 146.

[26] Report of the Committee Studying the Definition of Dead-Birth, *op. cit.* Appendix 2. p. 78.

[27] "Definition of Stillbirth" by Henry B. Hemenway . . . *op. cit.*

[28] *Ibid.*

[29] *Report on the Definition of Stillbirth and Abortion, op. cit.*

[30] "Diversity of Stillbirth Definitions and Some Statistical Repercussions", *op. cit.*

The recommended definition[31] of a foetal death is, in fact, the reverse of the live-birth definition given on p. 46 and reads as follows:

> "Foetal death is death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy; the death is indicated by the fact that after such separation the foetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles."

The difficulty of obtaining complete registration of foetal deaths was recognized by the World Health Organization Committee but, in view of the inadequacies of the previous international stillbirth definition and its failure to gain general acceptance, and keeping in mind the real need for information on total pregnancy wastage, the Committee considered it expedient to recommend the above definition, together with certain supplementary proposals for improving registration and statistics which will be discussed in a later chapter.

(a) *National practice*

Since the new international standard definition has been in existence only four years and since its adoption by national governments often involves complex legislative revisions, it cannot be expected that it will as yet have attained wide acceptance. Information on its status as of October 1953, however, is available in a provisional report[32] issued by the World Health Organization in connexion with the International Conference of National Committees. According to this report, 16 countries out of 46 polled had adopted or would adopt in 1954 the foetal-death definition. The names of the countries in this group, together with the date when the definition was adopted, are given below:

Brazil	January	1950
Burma		1951
Costa Rica	January	1952
Finland	(no date)	
Iraq	(no date)	
Israel	May	1953
Italy		1952
Jordan	February	1950
Korea		1954
Mexico	January	1950
Netherlands		1954
New Zealand		1953
Norway		1954
Turkey	January	1950
United States		1951
Venezuela	January	1951

The Dominican Republic, Egypt, Japan, and Panama have adopted a definition which incorporates the "any-evidence-of-life" criterion, but they also maintain a "physical viability" criterion based on utero-gestation period.

[31] Recommendation of the Subcommittee on the Definition of Stillbirth and Abortion of the World Health Organization Expert Committee on Health Statistics, at its first session in Paris, 27 February to 3 March 1950 (World Health Organization, *Technical report series*, No. 25. p. 12) which was adopted, as one of the recommendations under Article 23 of the Constitution and Article 17 of the "Regulations No. 1" of the World Health Organization, by the Third World Health Assembly, 19 May 1950. (WHA3.6) (World Health Organization, *Official Records*, No. 28. p. 16-17.)

[32] *WHO Definitions of "Live Birth" and "Foetal Death", op. cit.*

2. SUMMARY

The importance of focusing attention on foetal deaths i.e., on all pregnancy wastage rather than that after some arbitrary utero-gestation period has been attained, is being recognized by many countries of the world. As infant mortality is decreased and its causes eliminated, the corresponding problem of death prior to birth becomes relatively greater. Even though complete registration of all products of gestation will probably not become a reality for many years, the clarification of terms represented by the international definition of foetal death is a progressive step. In the past, lack of uniformity in definitions has been augmented by confusion in the use of such terms as "abortion", "miscarriage", and "stillbirth". The comprehensive definition, which requires no criterion other than that of absence or presence of "evidence of life", will do much to clarify this confused terminology.

E. MARRIAGE

For purposes of vital statistics, it is necessary to define a marriage even though it is recognized that the concept of marriage is essentially legal, ceremonial, or religious and not especially adaptable to statistical definition.

The definition of a marriage accepted in a country depends on the law governing the civil contract or upon the tribal or customary rules governing the union. Under the social organization of some populations, unions by mutual consent without ceremonial or legal rites constitute formal, legal marriage contracts, in no way different from those sanctioned by religious or other customary rites. In some countries, Moslem law may allow the male to have a plurality of wives while under another law, in the same country, monogamy may be stipulated. In other countries, marriage is governed by civil law and is a civil contract which may or may not be supplemented by religious rites. In these countries, religious marriages which are not subsequently ratified by a civil authority do not constitute valid marriages. In still other countries, the civil registration of the marriage alone constitutes the validating procedure.

1. CURRENT INTERNATIONAL STANDARD DEFINITION

Because of all these differences of a legal, religious, or civil nature and because of the necessity of establishing a "working" definition, the Statistical Commission of the United Nations has proposed the following for purely statistical purposes:[33]

> "Marriage is the legal union of persons of opposite sex. The legality of the union may be established by civil, religious, or other means as recognized by the laws of each country; and irrespective of the type of marriage, each should be reported for vital statistics purposes."

This definition is designed to include, for statistical purposes, all legal unions, irrespective of the manner of establishing legality, so long as these were in accord with national custom. Theoretically, it would include consensual or common-law marriage, but because of the difficulty of counting these by the registration method, inasmuch as their principal characteristic is

[33] *Principles for a Vital Statistics System, op. cit.* p. 7.

the *absence* of legal registration, it is impractical to anticipate that they will be generally reported.

The problem of obtaining statistics on "consensual" marriages is still a vexing one. In many countries of the world, these informal unions, set up without benefit of ecclesiastical or civil sanction, constitute a sizable proportion of the total number of "unions" established each year. Demographically, they constitute units of family formation. Still, there is as yet no method of determining the current number of such unions, except in so far as the census of population reveals the total number existing, and no way of acquiring knowledge of the additions and subtractions from this number each year.

Since the "registration method" means the "continuous and permanent, compulsory recording of the occurrence and the characteristics of vital events [marriages] primarily for their value as legal documents and secondarily for their usefulness as a source of statistics," it is obvious that "registration" in the case of consensual as well as any other marriage would confer "legality" and thus remove the marriage from the very category under consideration. It is clear, therefore, that the registration method cannot be utilized to obtain statistics of "consensual marriages". Perhaps a method of notification based on a system of incentives could be established, whereby a couple through notifying authorities of the setting up of a household by a consensual union would receive some compensation ordinarily obtainable only by presentation of proof of marriage. Such a system might be effective not only in countries where such marriages, though common, are to a degree discouraged, but also in other cultures where marriage by mutual consent is the customary form.

The method periodically employed in many countries, whereby couples living in consensual unions are invited to register their "marriage" legally without payment of fee and without stigma, helps to reduce the number of such unions, but does not provide an annual estimate of the number of them. Also, it is conceivable that some couples may prefer the informal type of union to the legal one, inasmuch as in most countries it enables them to enjoy freedom from the legal obligations incurred by marriage. Such couples would not avail themselves of the privilege of converting the informal to a formal union, yet they might be amenable to "notifying" a responsible authority of the existence of their union, provided by so doing they benefited in some way.

It is quite clear that so long as marriage statistics refer to "registered unions", they will be non-comparable on an international basis. They will also remain of limited value for demographic and public-health purposes. Therefore, it is of importance for each country in which customary unions constitute a sizable proportion of the total to explore means of obtaining current returns on marriages of this type.

It is interesting to note that in Egypt, where marriage by contract is the accepted form, five types of marriage are recognized, one of which is "confirmation of unregistered unions". When such a type is being reported for statistical purposes, the duration of the unregistered union is required to be reported and also the number of children of the union. Likewise, Guatemala provides for distinction of new marriages from "consensual marriages" on the statistical report and asks for information on number of children.

2. National practice

Some measure of the extent to which countries in 1950 were defining "marriages" in a statistical sense to include all marriages performed may be seen from an examination of statistics of marriage reported to the Statistical Office of the United Nations for publication in the *Demographic Yearbook*. According to table 13 in the 1953 *Yearbook*,[84] 123 geographic areas reported marriage data. Of these areas, data for the following are modified by a footnote relating to the statistical definition of a marriage; civil marriages only: Mauritius, El Salvador, Guatemala, Mexico, Bolivia; religious marriages: Colombia, Zanzibar (Christian and Moslem only); marriage licences issued: United States, Canal Zone, Virgin Islands (US). In addition, it should be noted that in countries where Moslem law regulates marriage and divorce and, specifically in Egypt, there are five types of marriage: (1) new marriage contracts, (2) "Tasabok" or confirmation of unregistered unions, (3) "Ragaa" or resumption of marriage after revocable divorce, (4) resumption of broken marriage without intervention of another husband, and (5) resumption of broken marriage after intervention of another husband. It is known that the latter is considered statistically as a new marriage. However, confirmations of unregistered unions (type 2), "returns" (type 3), and re-marriage without intervention of another husband (type 4) all appear to be included in the statistics for Egypt.

3. Effect of variation on statistics of marriage

The effect of these variations in the statistical definition of marriage cannot easily be measured because of basic differences in the laws and practices. Undoubtedly, inclusion of all types of marriages in statistics for Egypt would increase the rate, but no data are available on this point. For other countries, some measure can be obtained from examination of the trend of marriage rates for countries which have changed their statistical definition. For example, prior to 1947, Angola, the Portuguese possession in Africa, tabulated marriages recorded in church registers. In 1947, the statistical definition was revised to include all marriages performed, with a consequent increase in the crude rate from 1.7 to 2.2 per 1,000. Some of this change might conceivably be due to an increase in "completeness", but the rate has remained above two for all subsequent years, though it had never reached that level previously. A more striking change is evident in the statistics of Surinam, where a shift in 1941 from civil marriages to all marriages, including Hindu and Moslem ritual marriages, changed the rate from 3.0 to 8.2.

The use of data on "licences issued" instead of "marriages performed" results in a total greater than the number of marriages actually performed. This is so because marriage licences are declarations of intent, like marriage banns, and are not necessarily followed

[84] *Demographic Yearbook*. United Nations. Statistical Office. 5th issue, 1953. p. 276-281. (Sales No. 1953.XIII.9)

by a marriage ceremony. The extent of the overstatement has been investigated for the United States.[35] For 18 selected states of the United States where the two series may be compared, it has been shown that in 1948, 1949, and 1950, the number of marriage licences exceeded the number of marriages performed by 1.9, 2.4, and 1.4 per cent respectively. Some of this may, of course, be due to the time reference, i.e., licences issued in one year may be used in the succeeding year, but there is no doubt that a major part of the difference is real.

F. Divorce and annulment

1. Current international standard definition

In order that data on divorce may be internationally comparable, the Statistical Commission has recommended[36] that, for statistical purposes, a divorce should be defined as follows:

> "Divorce is a final legal dissolution of a marriage, that is, the separation of husband and wife by a judicial decree which confers on the parties the right to civil and/or religious remarriage, according to the laws of each country."

The two important elements in this definition are the limiting of divorce statistics (1) to *final decrees,* and (2) to decrees which confer the "right to remarry". These limitations have as their aim the exclusion from divorce statistics of "petitions" and also provisional decrees preparatory to the final action.

The two terms "petition" and "divorce" have for each other somewhat the same relationship as the concept of "licences" has to marriages, and a compilation of petitions is undesirable as a basis of divorce statistics for the analogous reasons. It should be emphasized also that this element of the United Nations definition will apply to divorces in polygamous as well as to those in monogamous cultures, the intent being to consider only the *final,* non-revocable divorce as the event to be counted. Provisional divorces or suspended marriages, which do not confer on the wife the freedom to remarry whom she chooses, would be counted separately under headings other than divorce.

In some countries, dissolutions of marriage without the privilege of remarriage, which amounts in effect only to "legal separation", are sometimes called "divorces". These events are not divorces according to the statistical definition. They are, in fact, sometimes a preparatory phase to divorce, the final decree being granted automatically after a stated period of legal separation. In this respect, they are somewhat analogous to the "suspended marriage" under Moslem law.

The second element of the definition, that is, the "right-to-remarry" aspect, also has important connotations in statistics of divorce. Final dissolution of the contract of marriage in these terms may not always be known as a "divorce", but if there is provision for a dissolution of marriage which confers at the same time the right to remarry, then for statistical purposes this event should also be reported. Such an additional method of marriage dissolution is the "annulment" defined, for statistical purposes, by the United Nations Statistical Commission[37] as follows:

> "Annulment is the invalidation or voiding of a marriage by a competent authority, according to the laws of each country, which confers on the parties the status of never having been married to each other."

To implement the reporting of all final dissolutions of marriage which confer the right to remarry, it will be necessary perhaps for each country to report routinely "annulments" as well as "divorces", because the former take the place of divorce in countries where "divorce" is not recognized or is difficult to obtain.

An example of the inter-relationship of these two vital events may be found in the experience of the United States, where both methods of marriage dissolution exist. As is to be expected among autonomous political units, the grounds for, and the regulations governing, divorce differ among the various states. The State of Nevada, for example, makes divorce a relatively simple procedure. The State of New York, on the other hand, has only a few grounds for divorce, principal of which is "infidelity". But, the grounds for obtaining an "annulment" in New York include "fraud", loosely defined, which has led to the frequent substitution of the latter means of marriage dissolution for the former. The effect of this substitution may be seen in the statistics of New York, where it is shown that, in 1950, reported annulments (which do not necessarily represent the total) constituted 30.8 per cent of the combined total of 11,700 divorces and annulments.[38]

2. National practice

In order to evaluate completely the extent to which countries are already adhering to the standard definition of divorce described above, it will be necessary to turn again to the statistics of divorce submitted by countries for publication in the United Nations *Demographic Yearbook.* An examination of table 15 in the 1953 *Yearbook*[39] reveals that divorce statistics were available for some 70 geographic areas and that some series were noted as differing from the standard definition. These modifications and the areas affected are given below:

Alaska	Annulments are included
Canal Zone	Petitions for divorce
Costa Rica	Petitions
Egypt	Statistics refer to religious divorces and for Moslems include revocable divorces and annulments
Fiji	Petitions
Finland	Annulments are included
New Zealand	Annulments are included
Northern Ireland	Petitions
Puerto Rico	Annulments are included
Thailand	Petitions
United States	Annulments are included
Virgin Islands (US)	Annulments are included
Yugoslavia	Some annulments are included
Zanzibar	Moslem divorces only

[35] *Summary of Marriage and Divorce Statistics: United States, 1950.* Federal Security Agency. Public Health Service. National Office of Vital Statistics. Vital Statistics — Special Reports. National Summaries. Vol. 37, No. 3, Washington, 29 October 1952. p. 53.

[36] *Principles for a Vital Statistics System, op. cit.* p. 7.

[37] *Ibid.* p. 7.

[38] *Summary of Marriage and Divorce Statistics: United States, 1950, op. cit.* p. 54.

[39] *Demographic Yearbook* (1953), *op. cit.*

3. Effect on statistics

The effect of the variations in national practice mentioned above is very difficult to appraise except in a few instances such as Egypt where the number of "divorces" will be greatly overstated, inasmuch as they include not only final decrees but also revocable divorce and suspension of married life, resumption of which requires a new contract with dowry.

The inclusion of annulments with divorce produces a measure of marriage dissolution effected through legal means, but statistics on this base may not be strictly comparable with those which relate to "divorce" alone. In general, where divorce as defined above is recognized by law, the number of annulments or cancellations of marriage bonds is usually quite small. On the other hand, where divorce is difficult to obtain — as pointed out for New York State — annulment may tend to take its place as a means of accomplishing marriage dissolution. In the states of the United States, the percentage that annulments constituted of the combined number of dissolved marriages in 1950 varied from 0 to 30.8, but all but two of the 39 states reporting showed a percentage well below 5.[40]

The substitution of petitions for final divorce decrees has the effect of increasing the divorce rate by a small amount, but the magnitude is unknown. The important limitation of using statistics of "petitions" rather than of "divorces granted" lies in the time reference of the data. In these instances, data such as "age of divorcees", "age of dependent children", and so forth, may refer to the time of the petition rather than to the date of the decree and, thus, may involve appreciable errors. On the other hand, statistics of petitions represent current cases; they are relatively stable, being uninfluenced by the delays commonly encountered in obtaining court hearings.

[40] *Summary of Marriage and Divorce Statistics: United States, 1950, op. cit.* p. 54.

G. Other

The statistical definitions given above have been devised in an attempt to standardize statistics of live birth, death, stillbirth, foetal death, marriage, divorce, and annulment. The four other events which, according to the United Nations *Principles*,[41] constitute the field of vital statistics (see chapter I) are "adoption", "legitimation", "recognition", and "legal separation". Definitions of none of these have had prior international acceptance. They are recommended by the Statistical Commission as a means of improving statistical registration and reporting and, as such, are set forth below:

> "*Adoption* is the legal and voluntary taking and treating of the child of other parents as one's own, in so far as provided by the laws of each country. ('Affiliation' is considered a type of adoption.)"
>
> "*Legitimation* is the formal investing of a person with the status and rights of legitimacy, according to the laws of each country."
>
> "*Recognition* is the legal acknowledgment, either voluntarily or compulsorily, of the paternity of an illegitimate child."
>
> "*Legal separation* is the disunion of married persons, according to the laws of each country, which does not confer on the parties the right to remarry."

[41] *Principles for a Vital Statistics System, op. cit.* p. 7.

CHAPTER V

REGISTRATION—THE REGISTRAR AND THE INFORMANT

A. The registrar

According to the definitions developed by the United Nations and employed in the *Principles for a Vital Statistics System*,[1] the registrar "is the official authorized to register the occurrence of a vital event and to record the required details with respect to it" and, representing the legal authority of government in the field of vital registration, is responsible for ensuring compliance with the law.

1. DUTIES AND RESPONSIBILITIES

(a) *International recommendation*

In recognition of the paramount importance of the registrar in the vital-statistics system and his extensive duties, the Statistical Commission of the United Nations has described his responsibilities in separate principles (numbers 207 and 305)[2] which are given below:

"207. *The registrar — his duties and responsibilities with respect to registration*

"(*a*) The duties and responsibilities of the registrar (or his equivalent) at the local, intermediate, and national levels should be codified.

"(*b*) The responsibilities of the registrar should include, as appropriate, the legal recording of the specified information regarding vital events; the responsibility for ensuring compliance with the registration law; the responsibility for the accuracy and completeness of each record; the obligation to adopt such measures as are required to inform the public of the necessity, procedures, and requirements for effecting registration, and the value of vital statistics; the custody of records; and the recording and reporting of data for statistical purposes.

"(*c*) The position of 'registrar' should be one of local prestige and responsibility with remuneration sufficient to attract competent personnel."

"305. *The registrar — his duties and responsibilities with respect to recording and reporting statistical information*

"(*a*) The legal definition of the responsibilities of the registrar should specify that he has duties with respect to recording and reporting information for statistical purposes in addition to his responsibilities for filing legal records of events.

"(*b*) Whether the specified procedure provides that he transmit to the statistical authorities a duplicate of the original legal record or an independent statistical form . . . , this report should be as complete and accurate as he can make it and the coverage in terms of events occurred should also be complete and timely."

It will be noted that these Principles are concerned not with the detailed duties of a registrar but with establishing the responsibilities of his office as essential elements of the vital-statistics system. To achieve this end, Principle 207 specifies first that the registrar's duties be codified. This step would be advantageous not only in establishing the prestige of the position (which is the subject of paragraph (*c*) of the Principle), but also in unifying and standardizing the work of the independent registrars. It would provide each registrar with a guide for the carrying out of his duties, and also serve as a device for training new registrars.

Following the recommendation on codification, the two Principles set forth in general terms the duties of the registrar in respect of registration and statistics, emphasizing the need for accuracy and devotion to duty.

Registration. On the registration side, the registrar is responsible for becoming aware of and receiving reports on all live births, deaths, stillbirths, marriages, and divorces, as well as other vital events registrable in his area. He must be familiar with the registration law and assume responsibility for its interpretation and for securing compliance with it. He must publicize his office, as well as the obligations of the public, in such a way as to obtain complete and prompt registration. The registrar must complete (often in duplicate or triplicate) a written record describing each event; he must examine the facts critically and have them certified for accuracy by the informant, take steps to correct inexact data or to obtain additional information if required, assume custody of the legal records, provide for searches of files and the issuance of certified copies of records, issue burial permits, make complaints against those who fail to register, and perform any other registration function the law may place upon the office of the registrar.

Statistics. To meet statistical needs, the registrar has the duty of completing a statistical report on each vital event registered — a report which he is bound to transmit to the one or more authorities charged with the compilation of vital statistics. He must transmit these reports according to a schedule which will allow him to secure the maximum number of registrations, to check and verify the completeness and accuracy of reported data and, at the same time, allow the statistical authorities sufficient time to produce from the reports current vital statistics, adequate to meet all needs. He may also be required to inform local health authorities of the occurrence of certain vital events such as live births, and deaths from certain causes.

[1] *Principles for a Vital Statistics System; Recommendations for the Improvement and Standardization of Vital Statistics.* United Nations. Statistical Office. Document ST/STAT/SER.M/19, 26 August 1953. p. 25. (Sales No. 1953.XVII.8)

[2] *Ibid.* p. 8 and 10 respectively.

The duties of the registrar are essentially the same in every country, whether he receives his information directly from the informant as in Canada, England and Wales, Ceylon, and Australia; or through a secondary source, as in the United States, Syria, and India. The registrar is, in either case, the most important person in the vital-statistics system because upon the data collected by him rests the super-structure of statistical classifications and tabulations. The accuracy and completeness of the basic data are the important aspects of vital statistics, and every effort should be made to increase the efficiency with which the registrar executes his responsibilities in order that the basic data may be of the highest quality.

2. Identity and qualifications

Although his duties are similar, the specific identity of the local registrar varies from country to country. In countries where the municipal authorities have jurisdiction over registration, the registrar may be the mayor or his deputy, a judge, a justice of the peace, or a civil officer; in rural India, Burma, Pakistan, and Thailand, he is usually the headman of the village; in rural Egypt, the tax collector. In countries where registration is an ecclesiastical function, the registrar is the pastor or the parish clerk. In countries where registration is under the jurisdiction of an autonomous registration agency, he is usually a paid official whose principal job is registration of vital events, as well as of lands, deeds, and so forth. In areas where the health department is responsible for the local registration function, the registrar may be the medical officer of health or his deputy, as he is in the municipalities of India, Burma, Israel, Jordan, Pakistan, and Egypt; in the United States, the "local registrar is usually a part-time deputy of the State registrar, paid by fees and performing no other official duties; but in a few places he serves as registrar ex officio, along with more pressing duties as justice of the peace, or as township or city clerk . . . The roster of local registrars includes housewives, pharmacists, merchants, physicians' wives, farmers, undertakers".[3]

Whoever he may be, the local registrar is the official of the government who comes in contact with the informant; the informant, in turn, is the "public". The registrar is, thus, a public servant employed either full- or part-time in one of the important undertakings of the government, that is, the establishment of records attesting to civil rights. He should, therefore, possess those qualifications and attributes which will tend to inspire confidence not only in the persons who are required to notify him of the occurrence of vital events, but also in the statistical authorities who depend on him for their basic information. He should be an adult of good character, who will impart to the office the dignity and prestige necessary to promote compliance with the registration law.

3. Number of registrars

The number of registrars in any given country is determined by the number of primary registration units, which in turn is determined in part by the organizational pattern. If registration is carried out through a network of parishes, then there will be as many registration units and, therefore, registrars as there are ecclesiastical parishes. However, in most countries of the world, the boundaries of the primary registration units conform to administrative boundaries, such as those of communes, towns, townships, or districts. The size of the population group which one registrar or one registration unit is designed to serve is sometimes fixed by law, but internal migration and changes in the character of areas make such specifications almost useless and, in fact, detrimental to good registration. Good registration must be flexible, adapting itself to changing conditions, and a too rigid requirement in terms of registration-unit size may immobilize the system and prevent it from making the adjustments required to meet changing needs.

(a) *International recommendation*

In view of the complexity of this aspect and the many factors involved, only a very general recommendation can be made for international purposes. The United Nations Principle[4] on the subject is as follows:

"206. *Number and size of primary registration units*

"(*a*) Local registration offices should be established in adequate numbers and in such locations as will ensure that they are easily accessible to the public, and they should be kept open for business during convenient hours, so that the informant may comply with the registration requirements within the time allowed for current registration.

"(*b*) The size of the primary registration unit should be such that the registrar in charge can give to that unit the attention required to produce good registration."

Accessibility. It is a maxim that the provision of a registration office easily accessible to every segment of the population is the first step in securing complete registration. If, to register a vital event, an individual must travel a long distance at some inconvenience and expense to himself, he will tend to neglect registration entirely or, at best, delay it.

If the registration office is open for only certain hours of the day or only on certain days of the week, its accessibility to the public is limited seriously, and compliance on the part of the informant is that much less to be expected. It is noteworthy that some civil codes specify that the civil register shall be open for business at all hours of the day or night as, for example, article 6 of the Order of 24 November 1945 in Poland which states:

> "Civil registrars shall be bound to perform civil registration duties even outside office hours and on Sundays or holidays, if refusal to do so is likely to cause to the party concerned serious material damage, loss of civil rights, or other similar consequences, or if the public interest demands it." [translated from Polish]

Manageability. From the registrar's point of view, and in the interests of improving registration, the size of the registration unit in terms of both area and population density should be such that the registrar can give to

[3] *Measures Relating to Vital Records and Vital Statistics; Message from The President of the United States Transmitting Report of the Bureau of the Budget.* House Document No. 242, 78th Congress, 1st Session. Gov. Print. Off., Washington, 1943. p. 55-56.

[4] *Principles for a Vital Statistics System, op. cit.* p. 8.

that unit the attention required to produce good registration. Such "attention" may involve keeping informed by one way or another of all the events occurring in the area, or simply handling expeditiously all requests for registration, searches and certified copies. For a superintendent registrar, it may mean being able to check on and examine periodically the work of subordinate registrars. For every registrar, it means being informed of the events which have occurred, recording these accurately and promptly in the official registers, and completing and transmitting on schedule the statistical reports for which he is responsible.

(b) *National practice*

Information on the number of primary registration units in existence in 1950 — and, therefore, the number of registrars — is available for only 28 of the 65 countries under study. The numbers reported have been set forth in table 6, where they have been related first to the area of the country in question and secondly, to the population.

Table 6. Number of Primary Registration Units in Relation to Area and Total Population: 28 Countries, as of 1 January 1950

Continent and country	*Approximate number of primary registration units* (1)	*Area* (Km^2) (2)	*Km^2 per primary registration unit* (3) = (2) ÷ (1)	*Population 1950 (in thousands)* (4)	*Population per primary registration unit* (5) = (4) ÷ (2)
AMERICA, NORTH					
Costa Rica	318	51 011	160	800	2 516
Cuba	259	114 524	442	5 362	20 703
El Salvador	259	34 126	132	1 859	7 178
Guatemala	315	108 889	346	2 803	8 898
Haiti	123	27 750	226	3 112	25 301
Honduras	269	115 205	428	1 505	5 595
Mexico	3 008±	1 969 367	655	25 706	8 546
Nicaragua	143	148 000	1 035	1 053	7 364
United States	40 000	7 827 680	196	151 689	3 792
AMERICA, SOUTH					
Bolivia	800	1 098 581	1 373	3 019	3 774
Chile	396	741 767	1 873	5 809	14 669
Colombia	807	1 138 355	1 411	11 260	13 953
Ecuador	637	275 000	432	3 203	5 028
Peru	2 000	1 249 049	625	8 405	4 203
ASIA					
Ceylon	662	65 607	99	7 544	11 396
Iran	106	1 630 000	15 377	18 772	177 094
Lebanon	20	10 400	520	1 257	62 850
Syria	135	181 337	1 343	3 215	23 815
EUROPE					
Belgium	2 670	30 507	11	8 639	32 366
Czechoslovakia	3 500+	127 827	37	12 340	3 526
Denmark	2 000±	42 936	21	4 270	2 135
Iceland	600±	103 000	172	143	238
Netherlands	1 016	32 388	32	10 114	9 955
Sweden	1 900	440 122	232	7 017	3 693
Switzerland	2 120	41 295	19	4 694	2 214
United Kingdom:					
England and Wales	1 200	151 103	126	44 020	36 683
Scotland	1 027	78 761	77	5 219	5 082
OCEANIA					
New Zealand	85	267 985	3 153	1 920	22 588

The number of primary registration units reported varies from 20 in Lebanon to approximately 40,000 in the United States. By relating the number of registration units to the area of the country as well as to the total population, a rough measure of the ratio required for "good" registration may be found. Although they are too few for definite conclusions, data in table 6 appear to show that small values of land area per primary registration unit are associated with good vital statistics and, therefore, with good registration. The smallest ratios (under 100 km.^{2} per registration unit) occur in Belgium, Scotland, Netherlands, Switzerland, Denmark,

Ceylon, and Czechoslovakia, while the largest land areas per registration-unit ratios (over 1,000) are found in Chile, Colombia, New Zealand, Syria, Iran, Bolivia, and Nicaragua. Because of variation in topography and density of population within a country, neither this index nor that computed on total population per registration unit is a strictly valid measure. Nevertheless, it may be interesting to note that, of the countries with a noticeable under-registration problem, Iran, Lebanon, Syria, Haiti, and Cuba show the highest ratios of population per registration unit among those for which data are available.

4. Methods of improving efficiency of registrars

Since the local registrar is the key element in the vital-statistics system, any attempt to improve vital statistics generally must begin with this official. There are a number of approaches to the "improvement" problem: one might deal with the post of registrar and its status, supervision, and related training activities; another is to treat the problem from the standpoint of the informant. The "post" approach will be considered first and in some detail.

(a) *Conferring status on the post*

In Principle 207, special mention has been made of the necessity for making the registrar a person of prestige. The post of "registrar" should be one of importance in the community so that registration is an acknowledged and willingly accepted obligation among the public. It will be noted that in countries where the registrar is a parish priest as in Scandinavia, or a recognized registry officer as in the United Kingdom, registration tends to be more complete and prompt than it does in areas where the registrar is a minor official or an illiterate headman of a village. In Ceylon, for example, the local registrars are "men with local influence and standing and [who] possess a good vernacular education. The registrars of births and deaths of the more advanced urban areas are medical men".[5] This emphasis on local registrars is reflected in the fact that Ceylon has the best vital registration in South-East Asia. To produce good registration, the registrar must have such standing in the community as will induce and enable him to carry out his responsibilities faithfully, to inform himself of all vital events by co-operative arrangements with persons who are in a position to have this knowledge, such as personnel in hospitals, clinics, and health centres, funeral directors, church personnel, court clerks, and so forth, and, at the same time, to be a servant in the public-service sense.

(b) *Providing adequate remuneration*

Despite the heavy responsibilities of the post of registrar and the essential nature of his work as a determinant of the quality of the resulting statistics, the post is rarely well paid. In a few instances, the registrar may be an unpaid official depending on fees received from the public or, as in some parts of the United States, from the State Health Department.

The merits of establishing the post of registrar as a separate and independent paid office are obvious. When the local registrar is forced to undertake additional employment to finance himself, he will not be able to give his full attention to vital records and statistics. He may not be available for ready consultation by the public; he will not be able to establish and maintain the co-operative arrangements by which he may inform himself of the occurrence of vital events. Moreover, if the office of local registrar is not a paid one, if the registrar receives remuneration on a per-capita basis only, he will rarely earn enough to make him a conscientious registrar or a person of community standing sufficient to encourage, or indeed compel, compliance with the registration law. It was with these limitations in mind that the Statistical Commission specifically stated in Principle 207 that the remuneration of the registrar should be "sufficient to attract competent personnel".

(c) *Limitation of number of posts*

In order to make the post of registrar one of prestige and influence, it is necessary that there be only as many as can be adequately financed as well as supervised, but determination of this optimum number involves several factors. As noted previously, there must be enough registration offices to make the process of registration convenient to the informant. On the other hand, if a lowering of standards is to be avoided, there cannot be so many that remuneration adequate to attract competent men becomes impossible to provide. A balance must be achieved between these factors, yet such a balance is difficult to achieve in practice. India, for example, has been faced with this problem on a very large scale. The Bhore Committee's scheme for improving vital statistics in India called for the establishment of one registrar for 18 villages in an area of 31.5 square miles. It was anticipated that the registrar would attend his office for three days each week, and during the remaining three days inspect the work of the *chowkidar*. Under such an arrangement, it was anticipated that the registrar could cover all areas under his jurisdiction once each fortnight. However, the costs of instituting a system of registration units such as was envisioned under the Bhore scheme appeared to be considerable, and a curtailed or consolidated plan was also proposed. Under the consolidated scheme, one registrar would be responsible for registration not in 18 but in 90 villages scattered over an area of 157.5 square miles.[6] It is obvious that the registrar's ability to improve the efficiency of registration would also be curtailed under such a consolidation.

Chile has a similar problem — a purely practical one and one due, in great part, to the peculiarities of Chilean geography. In the discussion of the ratio of registration units to population and area, it was noted that Chile was in an unfavourable position in respect of each index. Authorities in that country are fully aware of this factor in connexion with the under-registration problem and have suggested that improvement might be brought about by increasing the number of registrars, especially in the less well-inhabited parts of the south. However, those are also the parts of Chile where it is

[5] *Vital Statistics System, Ceylon*, by J. H. Ratnayake and P. Asirwathan. Paper presented at the International Training Centre on Vital Statistics and Health Statistics for South-East Asia, held in Ceylon, 19 September to 11 December 1951. 2 p. Mimeo.

[6] Interim Report of Sub-Committee on Statistical Material. Standing Committees of Departmental Economists and Statisticians. Delhi, Manager, Gov. of India Press, 1949. p. 14.

not practicable to establish a registration office because of the climate and the topography. It is likely that some other method of improving registration efficiency will be sought.

On the whole, it may be said that, other factors being equal, consolidation of too-numerous registration units may result in better registration. One example of this may be found in the recent experience of the State of Tennessee in the United States. According to the test of completeness of birth registration made in 1940, Tennessee showed a registration completeness of 80.4 per cent. During the decade following the 1940 test, every effort was made to improve registration completeness, one such step being the continued efforts to consolidate small registration units and reduce the number of local registrars. These consolidation efforts began in 1937 and ended in 1945 with the number of local registrars having been reduced from 756 to 96. Registration was placed in the local health department with the health officer becoming the local registrar. The consolidation of units is credited with providing better supervision, improving the qualifications of the registrars, and of developing better relationships between the public and the registration authorities. The change in the number and identity of registrars is, of course, only one of the factors which may have been responsible for the improvement, but in 1950 Tennessee showed 96.7 per cent completeness, and the largest percentage increase of any of the 48 states.

(d) *Instruction manuals*

The registrar, like every other individual entrusted with a responsibility, requires guidance or instruction as to the manner in which that responsibility is to be executed. He must be instructed with respect to the terms of the law under which he operates and the policies adopted in the interpretation of that law; he must be aware of his prerogatives as well as his duties. He must be told *how* to do his job, and he must be given the tools, in this case the forms necessary for registration. All of the instructions a registrar requires may be incorporated conveniently into one manual which he may keep on his desk at all times.

The wide-spread use of instruction manuals is a modern development of public administration. The idea that the functions of an operation or a job could be set forth clearly, step by step, and the elements clearly distinguished, has done much to increase efficiency in many fields. Their use in connexion with vital registration has had a similar effect. The consensus is that such instruction manuals are indispensable aids in securing more complete and accurate registration.

The United Nations Statistical Commission included in the *Principles for a Vital Statistics System*[7] one dealing specifically with this problem. In this Principle (208), the responsibility for improving the efficiency of registrars is placed on a central authority, but the scope of the Principle is left open to include — if desired — several of the techniques set forth below, i.e., training, conferences, consultants, etc., as well as the instruction manuals themselves. The Principle reads as follows:

"208. *Improving the efficiency of registrars*

"The national registration authority or its equivalent should take such steps as are necessary to provide guidance and instruction for registrars in the carrying out of their responsibilities."

Detailed instruction manuals for registrars have been developed by many countries, among which may be noted England and Wales, Ireland, Canada, New Zealand, Sweden, Switzerland, Colombia, and many others. If there is a central registration office, as in England and Wales and New Zealand, the registrar's manual has been the concern of the central authority. In the absence of a central registration authority, the responsibility for issuing instructions and forms has usually fallen on the Ministry of which the local offices are dependencies. In a few cases, the statistical service has assumed this function. In the United States, where there is no federal jurisdiction over registration, many states have prepared local registration manuals. Some of these manuals are of the loose-leaf type, which facilitates revision by providing a simple and inexpensive method of either changing or augmenting instructions. Each phase of the registration function is covered in clear, simple language. A review of the provisions of the state law and the organization for vital statistics, as well as the uses that vital records and statistics serve, is usually included, together with facsimiles of all records and reports.

The problem of keeping instruction manuals abreast of current developments can be solved, as noted above, by adopting a loose-leaf type of publication to which leaves may be added or from which they may be deleted as the occasion arises. Such a system makes it possible for the central office to keep local registrars supplied with current information and to do this inexpensively. It will also provide a ready-made co-ordinating mechanism in that there will be a constant need for the central office to keep in touch with the local units.

(e) *Inspection and post-auditing*

Since local registrars constitute the periphery of the registration administration, there is value in a system of inspection or review to ensure that the various units are following instructions and carrying out their responsibilities in an acceptable manner. Inspection of the registers is one effective method of improving the efficiency of the registrar. However, inspection without introducing new or improved procedures would be sterile. Inspection and interchange of work-practice experience constitutes a method of improving efficiency.

(f) *In-service training*

Another public-administration technique, that of training the registrar in the principles of his duties before he actually assumes responsibility, would be effective in improving his subsequent efficiency. In actual practice, it is probably true that most registrars take over their duties with little or no instruction from their predecessors. In many cases, there is no opportunity for the incumbent to train his successor. When the position of registrar attains the status of a full-time responsible position, consideration can be given to training new recruits prior to their assignment and for giving "refresher" training to incumbents. The refresher training courses designed for registrars in office should be supplemented also by continuous training programmes for the

[7] *Principles for a Vital Statistics System, op. cit.* p. 8.

medical personnel responsible for reporting the information concerning cause of death and certain information on live births and stillbirths. The desirability of establishing and maintaining such programmes both for registrars and medical personnel has been substantiated by the United Nations Principle 306[8] on "Improvement of completeness and accuracy of data reported for statistical purposes", where in paragraph (*b*) it is suggested that:

> "Methods to improve basic data by means of continuous training and instruction of registrars and of medical personnel should be an essential part of an effective vital statistics system."

(g) *Conferences*

Another method of training which can be utilized either alone or in conjunction with the issuance of manuals is the technique of bringing together a number of registrars to give them group instruction in the elements of their work or to introduce them to new forms and procedures. Such conferences need not be of long duration or of a costly nature. They may be held in conjunction with a broader type of conference which brings together officials from every phase of the vital-statistics system. Such conferences may help to improve the efficiency of registrars by focusing attention on the basic nature of their work and by providing them with the opportunity of exchanging ideas on their mutual problems. In order that the optimum advantage may be obtained from such conferences, a regular schedule of meetings should be developed so that the registrar may be provided with a definite, pre-arranged medium for learning and for discussion of the problems which arise in the course of his work.

(h) *Consultant advice*

Still another means of providing guidance to registrars is by regular visits of consultants from the headquarters office to the local offices. Not only do such consulting services allow the registrar to obtain first-hand advice on his problems, but they serve to instill in him the idea that his work is important and, therefore, worthy of his best efforts. Consulting services may be combined with the inspection procedure which seeks to maintain the quality of the registrar's efforts at a high level, but by so doing the usefulness of the consultant as an adviser may be impaired. It may be preferable, therefore, to separate these two functions, unless every effort is made to maintain a favourable balance between assistance and inspection.

(i) *Group activities*

The establishment of a professional association of individual registrars for the purpose of exchanging views on the administration of registration as well as its problems is still another method by which the status and work of registrars may be improved. By definition, such associations would be limited in their deliberations to consideration of problems which have their origin in registration, those requiring co-ordinated effort remaining within the competence of conferences with broader membership. The technique is especially useful when the registration organization for vital statistics is not centralized. In such cases, some means must be found of forming the registrars into a single group with a unified purpose. National associations of registrars might tend to exclude the local official, but the technique is certainly applicable at any level — national, provincial, or local. At one or all these levels, associations of registrars might prove to be the answer to the co-ordination of a decentralized system.

B. The informant or registrant

1. Duties and responsibilities

The raw data of vital statistics usually have their origin in one person — the informant. The informant is the individual whose responsibility, designated by law, is to report to the registrar the *fact* of the occurrence of a vital event, together with certain of its characteristics. Only on the basis of his report may the event be legally registered by the registrar.

Not only must the informant provide information for registration purposes, but he also must provide such data as are required for purely statistical purposes. Sometimes these two sets of data are identical, but in many others supplementary information which does not appear in the register is required for statistical purposes. The informant should be the person best equipped to provide all the facts and to provide them accurately within the time period allowed and at the place specified in the law.

(a) *International recommendation*

In order that the informant may fulfil all these requirements, it is important that he should be clearly and unequivocably designated so that one and only one person will have primary responsibility for the registration. To provide guidance on this important aspect, the United Nations has made certain proposals which are set forth in Principle 209,[9] as follows:

"209. *Designation of legally responsible informant*

"(*a*) Responsibilities with respect to informing the registration authorities of the occurrence of an event should be clearly and unequivocably designated by law or regulation, and publicized in such a way that familiarity with the legal obligations is established.

"(*b*) Provision should be made for delegation of authority in certain circumstances as required by questions of literacy, topography, place where event occurs, and so forth.

"(*c*) As far as possible, medical certification of cause of death should be the responsibility of the attending physician."

It will be noted that this Principle makes no recommendation with respect to the informant's identity but only to the need for clear designation of the principal registrant and for making this responsibility known to the public. Unless the informant, be he the parent, the physician, the midwife, the undertaker, or the priest, is aware that he is required to register the vital event of which he has knowledge, and that no one else shares his responsibility, he cannot be expected to comply.

The need for a substitute or alternate informant who may take responsibility under certain circumstances in most cases may arise because of the place where the event occurred. As will be seen below, it is customary in most

[8] *Ibid.* p. 10-11.

[9] *Ibid.* p. 8.

countries to provide that, when a birth or death occurs in a hospital or other institution, the administrator of the establishment must assume responsibility for registration. In places where health units are well established, the sanitary inspector or the midwife may take on the duties of registering the event. These provisions are primarily matters of convenience to be decided according to national circumstances.

In connexion with birth, death, and stillbirth registration, it is important to note that the informant's function is one of *declaration,* not to be confused with the supplementary function of medical certification of live birth or of cause of death or stillbirth. The declaration of the *fact* of birth or death is obligatory or compulsory for a designated informant in every civilized country of the world; the certified cause of death or stillbirth is not registrable information universally, although it is a statistical item in almost every country. Usually the responsibility for reporting the occurrence of a death falls on a lay person, while the responsibility for certifying the cause of death devolves upon the attending physician or, in the absence of attendance, on the coroner who examined the body.

2. Identity

The responsibilities involved in registering the occurrence and the characteristics of a vital event are usually assigned by the registration law or its supplementary regulations. The person primarily responsible is identified in the law, together with a series of alternates upon whom devolves the duty in case the individual primarily responsible is dead, incapacitated, or otherwise unable to fulfil his legal obligations. Alternative responsibility is assigned in descending order from individuals who, by virtue of relationship, are most likely to have relatively accurate information on the event in question, to those who have only a knowledge that the event has taken place.

The "informant" described above must not be confused with the "notifier". The notifier is the individual who, in some countries, is responsible by law for informing the registrar of the occurrence of an event, but the report by which this is accomplished has no value except as a "notification" or a control on registration. It cannot be converted into the legal registration record; the notifier does *not* sign the register; his report can only provide a "lead" as a result of which the registrar may take steps to obtain the information required from the legal informant. The supplementary notification process is generally limited in its application to the registration of live births, deaths, and stillbirths, because these are the vital events the occurrences of which are known to two quite independent sources of information.

(a) *National practice*

The identity of the person who, in 65 countries, bears primary responsibility for supplying the registrar with information about live births, deaths, stillbirths, marriages, and divorces is shown in table 7. For the few countries where definite information is available, the "notifier" is also identified.

Table 7. Identity of Informant for Registration of Live Birth, Death, Stillbirth, Marriage, and Divorce; Identity of Notifier of Live Birth and Death: 65 Countries, as of 1 January 1950

(Three dots "..." indicate that no information is available.)

Continent and country	Person primarily responsible						
	Live birth		Death		Stillbirth Informant	Marriage Informant	Divorce Informant
	Informant	Notifier	Informant	Notifier			
AFRICA							
Egypt	Father	Attendant	Relative	...	Father	Officiant	(1)
Union of South Africa	Father	...	Relative	Physician	...	Officiant	(1)
AMERICA, NORTH							
Canada	Father or mother	Attendant	Undertaker	...	Father or mother	Officiant	Clerk of court[2]
Costa Rica	Father or mother	...	Relative	...	Father or mother	Officiant	Interested party
Cuba	Father	...	Relative	...	Father	Officiant	Court and participants
Dominican Republic	Father	Occupier of house[3]	Relative	...	Father	Officiant	Party to whom divorce granted
El Salvador	Father	...	Relative	...	(4)	Participants	Tribunal granting divorce
Guatemala	Father or mother	(5)	Head of household	...	Father or mother	...	Mayor or judge
Haiti	Father	...	Parents	...	Parents	Participants	Participants
Honduras	Father	(5)	Surviving spouse	Attendant	(4)	Officiant	Court
Mexico	Father	Attendant[6]	Head of household	Physician[7]	...	Officiant	Court
Nicaragua	Father	Institution	Surviving spouse	...	...	Bridegroom	...
Panama	(8)	...	(8)	...	(8)	Officiant	Interested party
United States	Attendant	...	Undertaker	...	Undertaker	Officiant	Court[9]
AMERICA, SOUTH							
Argentina	Father	Attendant[6]	Surviving spouse	...	Father	Bridegroom	(10)
Bolivia	Father or mother	Attendant	Relative	...	Father or mother	Officiant	Clerk of court
Brazil	Father	...	Head of family	...	Father	Bridegroom	(10)
Chile	Father	...	Relative	Physician	Relative	Officiant	(10)
Colombia	Father	Institution	Head of family	...	(4)	Officiant	(10)
Ecuador	Father	Parish priest and institution	Relative	Priest and institution	Father	Bridegroom	Interested party
Paraguay	Father	...	Relative	...	...	...	(10)
Peru	Father	Attendant	Relative	Institution	(4)	Officiant	Court
Uruguay	...	...	...	...	...	...	...
Venezuela	Father or mother	Attendant	Relative	Physician	...	Officiant	Court
ASIA							
Burma	Father or mother[11]	...	Parents	...	Father or mother	(4)	(1)
Ceylon	Father[12]	Headman	Relative	Headman	Father	Participants	(13)
India	(14)	...	(14)	...	(14)	(4)	(10)
Madras (State)	Father	...	Nearest male relative	...	Father	(4)	(10)

(Continued on following page)

Table 7. Identity of Informant for Registration of Live Birth, Death, Stillbirth, Marriage, and Divorce; Identity of Notifier of Live Birth and Death: 65 Countries, as of 1 January 1950—*(Continued)*

Continent and country	Person primarily responsible						
	Live birth		Death		Stillbirth	Marriage	Divorce
	Informant	Notifier	Informant	Notifier	Informant	Informant	Informant
Indonesia (European population)	Father	...	Member of household, physician	...	Member of household, physician	Participants	Party who sought divorce
Iran	...	...	...	...	...	...	...
Israel	Father and headman[15]	...	Relative and headman	...	Father and headman	Officiant	(1)
Japan	Father	Attendant	Relative	Physician	Father	Participants	Participants[16]
Jordan	Headman	...	Headman	...	(4)	Officiant	(1)
Lebanon	Father	...	Headman	...	(4)	Bridegroom	Husband
Pakistan	Father	...	Relative	...	Father	(4)	(10)
Philippines	Attendant	...	Physician	...	Attendant	Officiant	(10)
Syria	Father and headman[15]	Attendant	Parents	...	(4)	Officiant and participants	Religious authority and participants
Thailand	Parents	...	Parents	...	Parents	Participants	Participants
Turkey	Father	...	Headman	...	(4)	Officiant	(1)
EUROPE							
Austria	Father	...	Head of family	...	Father	Participants	Court of Justice
Belgium	Father	...	Witnesses[17]	...	Father	Officiant	Participants
Czechoslovakia	Father	Attendant	Post-mortem examiner	...	Father	Officiant	(1)
Denmark	Father	Attendant	Parents	Physician	Father	Officiant	(1)
Finland	Father	Attendant	Parents	...	Father	Participants or officiant[18]	Court
France	Father	...	Relative	...	Father	Officiant	Court
German Federal Republic	Father	...	Head of household	...	Father	...	(1)
Greece	Father	Church, institution	Relative	Church, institution	Father	Bridegroom	Participants
Iceland	Midwife	...	Relative	Physician	Parents	Officiant	(1)
Ireland	Father or mother	...	Relative	...	(4)	Bridegroom or officiant[19]	(10)
Italy	Father or mother	...	Surviving spouse	...	Father or mother	Participants or officiant[20]	(10)
Liechtenstein	Father	Attendant	Head of family	...	Father	...	Court
Luxembourg	Father	...	Relative	...	Father	Participants	Party to whom divorce granted
Monaco	Father	...	Relative	...	...	...	...
Netherlands	Father	...	Physician	...	Physician	Participants	Participants
Norway	Parents	Attendant	Relative	Physician	Parents	Officiant	(1)
Poland	Father	...	Surviving spouse	...	Father	Officiant	Court
Portugal	Father	...	Head of family	...	Head of family	Participants	Secretary of tribunal
Spain	Parents	...	Parents	...	Parents	Participants or officiant	(10)

(Continued on following page)

Table 7. Identity of Informant for Registration of Live Birth, Death, Stillbirth, Marriage, and Divorce; Identity of Notifier of Live Birth and Death: 65 Countries, as of 1 January 1950—*(Concluded)*

Continent and country	*Person primarily responsible*						
	Live birth		*Death*		*Stillbirth Informant*	*Marriage Informant*	*Divorce Informant*
	Informant	*Notifier*	*Informant*	*Notifier*			
Sweden	Parents	Institution	Surviving spouse	Institution	Parents	Officiant	Court
Switzerland	Father	...	Head of family	...	Father	Officiant	Court
United Kingdom:							
England and Wales	Father or mother	Attendant	Relative	Physician	Father or mother	Participants	[1]
Northern Ireland	Father or mother	...	Relative	...	[4]	Bridegroom or participants[21]	[1]
Scotland	Father or mother	...	Relative	Physician	Father or mother	Participants	[1]
Yugoslavia	Father	...	Relative	...	Relative	...	[1]
OCEANIA							
Australia[22]	Father or mother	Attendant	Occupier of the house	Physician	Father or mother	Officiant[23]	[1]
New Zealand:							
European population	Father or mother	Attendant	Undertaker	Physician	Father or mother	Participants	[1]
Maori population	Father or mother	...	Undertaker	...	Father or mother	[24]	...

[1] Registered only as part of the records of the religious or judicial authorities concerned. There is no further compulsory registration in civil registry system.

[2] In most provinces (except Quebec where divorce is granted through the Parliament of Canada), divorce records are transmitted by clerk of provincial civil court to registrar of vital statistics of province where divorce was granted.

[3] If birth occurs in place other than residence of mother.

[4] Registration not compulsory.

[5] Proprietors of farms (estates) and administrators of institutions.

[6] Also head of household if birth occurs in place other than residence of mother.

[7] Including director of institutions.

[8] Attendant in District of Panama; father or close relative in Colón and rest of country.

[9] Registered locally as part of records of the court concerned; in some states, court official must send report to state.

[10] Divorce, in the sense used here, does not exist.

[11] In municipalities, "owner of the house in which the event occurs". Attempt being made to standardize on "parents".

[12] Delegated to superintendents on "estates".

[13] General divorces, registered in courts only; Kandyan, granted and registered by provincial registrars and assistant provincial registrars; and Muslim, granted by "Kathis" and registered by officiating priests on permits issued by the former.

[14] There is no uniform procedure. Generally speaking, in urban areas, person primarily responsible is head of family, male attendant, midwife or medical attendant. In rural areas, police watchman or revenue official.

[15] Headman in rural areas.

[16] If by mutual consent, husband and wife; if by court order, person who brought suit.

[17] Two persons over 21 years of age who have seen body.

[18] For religious marriages, the participants; for civil marriages, the officiant.

[19] For Roman Catholic marriages, husband; for all other marriages, officiant.

[20] For civil marriage, participants; for religious marriage, officiant.

[21] For Roman Catholic marriages, husband; for all other marriages, participants.

[22] Information for six states, i.e., New South Wales, Western Australia, Queensland, Victoria, South Australia, and Tasmania.

[23] Except in State of Victoria, where it is the participants.

[24] Registration not compulsory in 1950, but beginning 1 April 1952, subject to ordinary laws affecting European marriages.

Live-birth informant. With respect to live-birth registration, table 7 shows information for 63 countries. Of these, a total of 58 or about 92 per cent report that primary responsibility rests on the parents, and in 38 cases, specifically on the father. In four of the 58, the parent shares primary responsibility with another informant, depending on where the child is born. For example, in Panama, the hospital or health centre is responsible in the district of Panama, but in rural areas, the father must report the birth; in Ceylon and India, births on "estates" (tea and rubber plantations) are notified to the registrar by the estate superintendent; in Israel and Syria, the headman has primary responsibility in villages.

In only four areas does the medical attendant have primary responsibility for birth registration, namely in the United States, the Philippines, in the City of Panama, and in Iceland. Dependence on the physician in the case of the United States is understandable, inasmuch as close to 95 per cent of the live births are attended by a physician and, of these, the overwhelming majority occur in hospitals. Similarly, the services of a midwife are almost universally required in Iceland. But, in the Philippines and in Panama, where many births occur without medical attendance, responsibility may actually devolve on the parent.

It may be noted that only one country, namely Jordan, reports that the responsibility for recording a birth is assigned to the headman (*mukhtar*) rather than to the parents or to the attendant. In the rural areas of India also, the *chowkidar* is often specified as the legal informant and, as noted above, in Syria and Israel, the headman has this responsibility in the villages.

It should be borne in mind that table 7 shows only the identity of the person or persons named in the law as the one primarily responsible for legal registration. The other persons named as successive alternates — should the first named not be able to fulfil his obligation — range through the various consanguineous relationships to the "owner of the house where the event took place" or even to "any person having knowledge of the event". In the great majority of cases, however, the mother has a secondary responsibility with the father. This provides automatically for the problem which arises in connexion with registration of illegitimate births. In other countries, the medical attendant — if there was one — has the secondary responsibility; in still others, a relative who was present at the birth or who lived in the same house has secondary obligation. In Great Britain, the mother or father is succeeded by the "occupier of the house". It is interesting to note that in cases where the attendant has primary responsibility, the secondary obligation is always on the parent.

In a number of countries, the medical attendant who assisted at the birth or the administrator of the institution in which the event took place is given the responsibility of "notifying" the registrar in respect of every birth of which he has knowledge. According to table 7, a total of 24 countries report such a supplementary notification obligation, while several others report that the occupier of the house has this duty, especially if this house was not the residence of the mother.

Japan, Canada, Czechoslovakia, and New Zealand, for example, in addition to registration by the parent, require a report from the medical attendant. In Canada, the regulation varies a little from province to province, but that for British Columbia may be taken as typical. It provides that within 48 hours after the birth of a child, every medical practitioner in attendance at the birth of a child or — in the absence of such — every nurse so present, shall mail to the district registrar of the district in which the birth occurred a postcard giving notice of the birth. The provision covers reporting of stillbirths as well as live births, occurring in or out of hospitals. Upon receipt of the notification, the registrar mails to the parents a blank form which they, in turn, must complete for purposes of registration. In Ceylon, the headman must report to the registrar all the births of which he has knowledge. In some states of the United States, hospitals, cemeteries, funeral directors, and so forth, provide a list of births and deaths against which the registrations are checked. All of these provisions are designed to improve completeness of registration.

Effect of variation on statistics of live birth. The identity of the informant may have two potential effects on statistics: (1) the effect on the completeness with which registrations are made, and (2) the effect on the probable accuracy of the data registered.

With respect to completeness, it can be shown that virtually complete as well as obviously incomplete registration has resulted from vital-statistics systems which depend on parent responsibility. For example, Canada, the United Kingdom, Sweden, Switzerland, and Norway have virtually complete registration; while Haiti, Burma, Lebanon, Turkey, and Greece all may be said to have incomplete coverage with respect to live births. All of these countries depend on the parent to report the birth. It is obvious that, although it may be an important factor in completeness of registration, the identity of the informant is not necessarily a decisive one.

Coming now to the implications of "parent" versus "medical" participation on the accuracy of the registered data, there is reason to believe that parent reporting may have an effect on the quality of the information. The factors responsible for this potential improvement in accuracy may be set forth as follows: (1) the parent is the person with first-hand knowledge of all the non-medical information required for registration and for vital statistics — both that related to the event and that describing the parents; (2) the parent is usually more easily reached for re-checking information; and (3) the parent has the most to gain by seeing that registration is accomplished correctly.

When the doctor is made responsible for the legal registration act, as he is in the United States and the Philippines, he or his subordinate must obtain the necessary information from the parent. The individual doctors or nurses involved, not being subject to control in this matter, are not likely to develop uniform methods of obtaining answers. Furthermore, it should not be forgotten that making the physician responsible for registration places upon him a heavy load of extra work which he may not carry out to the limit of his ability, because of his primary pre-occupation with purely medical matters.

A registrar in questioning a parent directly can ask questions and record answers in a uniform and effective

manner. He can call upon the informant to verify the answers and to certify to their correctness in his presence. Information reported to the registrar by an intermediate person may tend to be less accurate.

The value of parent participation in birth registration has proved its worth in Europe, in Oceania, and in Canada where the basis for the adoption of this method is given by J. T. Marshall[10] as follows:

> "This procedure [parent participation] is based on the philosophy that after all the success of any registration system is dependent upon the psychological reactions of the population, and in vital statistics the responsibility for the registration of a birth should be placed upon those persons who are most interested in the welfare of the child, and who are directly responsible for its entry into this 'vale of tears'."

The author goes on to say that when registration is the responsibility of the attendant, either physician or midwife, in actual fact there is really no specific responsibility, inasmuch as in a great number of cases the birth is not attended by a physician or a midwife but by a friend or relative. These lay personnel are usually not aware of their responsibilities or loath to exercise them in areas where non-medical attendants are not allowed to practice midwifery. The problems of training this large and diversified group of "attendants" in the duties and responsibilities of the informant are overwhelmingly great. On the other hand, the education of the parent can be effected through many channels.

Neither of these arguments is effective, of course, for a country where practically all births are attended by a physician. In such an area, a medical practitioner, licensed by the State, is to some extent under the State's supervision and, because of this, may be expected to carry out his responsibility to register live births. Moreover, the group of physicians, being small, would in such a case be easier to educate than a whole population. However, these optimum conditions do not occur in many areas of the world. The United States which places primary responsibility on the attendant does so because of the high proportion of hospitalized deliveries (88 per cent in 1950) and the even higher proportion of births attended by physicians (95 per cent). However, the marked reduction in the proportion of births delivered by non-physicians has occurred only since 1935.[11]

Death informant. The person who is primarily responsible for registering the fact of ordinary death, i.e., non-coroner cases, was reported by 63 countries, as shown in table 7. Of these, 49 or 78 per cent of the group reported that the "relatives", the "parents", the "head of the household or family", the "surviving spouse", or a "member of the family present at the death" bore this responsibility. These 49 countries included most countries of Europe and Latin America. In contrast, Canada, the United States, and New Zealand placed primary responsibility for death registration on the *undertaker,* that is, on the person responsible for disposition of the body — a logical development in view of the widespread use of commercial undertaking facilities in these countries. Jordan, Turkey, and Lebanon require the headman (*mukhtar*) to report the death; while in the Philippines, the Netherlands, Czechoslovakia, and the urban district of Panama, primary responsibility to register is given to the *physician in attendance* if there is one. It should be noted, however, that — as was the case for live births — many other countries transfer the primary responsibility from the relative to the institution for such deaths as may be hospitalized or otherwise institutionalized. Also, the completion of the medical certificate of death which certifies to the cause is always the responsibility of the physician if there was one in attendance. However, in so far as the legal designation of responsibility is concerned, it is clear that in the great majority of the countries, the tendency is to place primary responsibility for death registration on one of the surviving relatives, that is, on that person most likely to have not only the required information about the decedent but also an interest in properly registering the death. The linking of the funeral director to the procedure serves only as a checking procedure in most countries.

In death registration, as is true also in live-birth registration, responsibility is assigned in a series of alternatives should the person primarily obligated not be in a position to fulfil his duties. Thus, relatives are ordered according to the degree of relationship and also to their whereabouts at the time of the death. Relatives living in the same house, though less closely related than others, may take precedence over a blood relation who lives elsewhere. Likewise, persons present at the death may take precedence over those who, though related, did not see the body.

The supplementary registrar-notification procedure is not so important in connexion with death as it is with birth, because of the fact that the almost universal requirement of a burial permit helps to control death registration. However, there are certain specified obligations for death notification. According to table 7, 18 countries report that this supplementary responsibility has been placed on either the physician who treated the deceased, the institution where the death took place, the priest who might have performed the burial rites, or the headman of the village who had knowledge of the death. All of these procedures are designed to control death registration with a view to increasing its completeness.

Effect of variation on statistics of death. Completeness of registration of death does not appear to be affected by the identity of the informant, though it is possible that the accuracy of the data is enhanced when their direct source is the nearest relative instead of the secondary funeral director, the headman, or the physician who must, in any case, secure them originally from the family involved.

Stillbirth informant. Table 1 showed that in ten countries stillbirths are not required to be registered. Of the 45 countries in which registration of still-

[10] *The Birth Registration System of Canada,* by J. T. Marshall. Department of Commerce, Bureau of the Census. Vital Statistics — Special Reports. Vol. 19, No. 16, Washington, 21 July 1944. p. 293.

[11] *Births by Attendant, United States, 1950.* Department of Health, Education, and Welfare. Public Health Service. National Office of Vital Statistics. Vital Statistics — Special Reports. National Summaries. Vol. 37, No. 20, Washington, 19 February 1954. p. 510.

births is compulsory and for which information on responsibility is given in table 7, a total of 41 or 89 per cent report that responsibility for registering a stillbirth rests on the parents, specifically on the father, one or both parents, or the head of the family. Thus, in so far as the identity of the informant is concerned, stillbirth registration follows the same pattern as live-birth registration.

In only seven countries, namely the United States, Chile, Indonesia, Iceland, the Netherlands, Portugal, and Yugoslavia, is the informant for stillbirths different from that for live births and, in these cases, responsibility falls on the person responsible for registering a death. The responsibilities for notifying the registrar of the occurrence of a stillbirth also generally follow the live-birth pattern.

Effect of variation on statistics of stillbirth. The deficiency in stillbirth registration in every country of the world is so notorious that it would be difficult — if not impossible — to assess the role of the informant in respect of it. One of the more likely causes of this deficiency might be that the registration of a stillbirth (or a late foetal death), unlike that of a live birth, confers no potential benefit on the parent in terms of post-natal care, children's allowances, or identity privileges. There is, therefore, no incentive to carry out the procedures of registration either within the legal period or at any later date.

The stillbirths which are registered are primarily those occurring in hospitals or with medical attendance and are, therefore, those reported by physicians. In the past, however, physicians have been known to describe a "stillbirth" as a product of gestation not subject to registration, i.e., an "abortion", when by so doing they could escape the "paper work" of completing the necessary registration forms. The recommendation that all foetal deaths be registrable rather than only those of 28 weeks of gestation and over theoretically would eliminate this potential source of incompleteness. In view of these facts, it appears that the identity of the informant is not a factor in the completeness with which stillbirths are now registered, nor will it be a major factor in the near future.

Marriage informant. According to table 7, liability for registering a marriage rests in 20 out of 54 countries upon one or both participants. In 29 countries, the officiant, who may be a member of the clergy, a justice of the peace, a municipal judge, or a civil registry officer, has responsibility. In only one country, Syria, is there dual responsibility involving the religious authority and the participant, though in Finland, Ireland, and Italy the officiant or the participants may have responsibility, depending on whether the marriage is civil or religious. The placing of primary responsibility on the officiant in certain countries where only a civil marriage is legal (Chile, Peru, Dominican Republic) or where religious authorities alone have the right to celebrate a marriage (i.e., Egypt, Israel, Jordan, Syria, Turkey) is equivalent to making the registrar the informant. In such cases, of course, the officiant usually collects the required facts from the participants in the form of an application for permission to marry (licence) or for banns.

Effect of variation on statistics of marriage. Since in many countries the registration of a marriage is necessary for its validity and since, for many reasons, its accuracy is a matter of great concern to the participants, the identity of the person responsible for the reporting of marriages to the civil registry authorities has little effect either on the completeness or accuracy of the resulting statistics. Marriages performed are usually registered, if not at once, eventually. Needless to say, common-law marriages — especially if their validity depends on their duration — would rarely be registered. A second group of marriages which would escape registration are those which, in a country where civil marriage is essential to legality, take place only before a religious authority. Such marriages would be entered in the church but not in the civil register. In neither case is the identity of the informant the important factor.

Divorce informant. In many cases (see chapter II), the court which grants the divorce also becomes custodian of the divorce records. These are the countries which in table 2 show the note "registered only by religious or judicial court concerned. No further registration is made". In other countries, the civil registration office registers divorces as well as births, deaths, and marriages. In the latter case, responsibility to see that registration is made falls usually on the registrar or the clerk of the court whose duty it is to send a certified copy or a transcript of the divorce record to the civil registrar. On receipt of the advice from the courts, the civil registrar either completes an appropriate registration in the separate civil register of divorce and/or makes a notation on the marriage record (i.e., in the "marriage and divorce register") to indicate that the marriage has been dissolved. In a number of countries, including France, Peru, Greece, the Netherlands, Liechtenstein, and Sweden, this notation constitutes the formal registration.

Table 7 reveals that in the 54 countries which recognize divorces, the court, through the registrar or the clerk, is the informant in 33, while the participants bear responsibility in 13 countries only. Because of the system and because of the natural interest of the participant in seeing that the event is recorded, it is probable that almost all divorces which occur are registered.

CHAPTER VI

THE REGISTRATION PROCESS

The identity of the person responsible for informing the registration official of the occurrence of an event has been set forth in table 7. The next element for consideration is the process of registration, that is, the "how", "where", and "when" of the registration procedure. No attempt can be made here to explore the legal questions of rights and privileges inherent in registration and the requirements for registering. The discussion will be limited to those aspects of the process which may have a bearing on the resulting statistics.

A. How current registration is made

Registration has been defined in the *Principles for a Vital Statistics System*[1] as the "legal recording with the authorized officials of the occurrence of an event . . ." The authorized official is the registrar. The authorized registrant is the person responsible for informing the registrar or, in other words, of making the declaration in respect of the event. The law of each country sets forth exactly how the responsibilities of these two individuals shall be exercised, but in general there are only a limited number of possibilities. Either the informant can make a verbal declaration, or he can submit a written statement either in person or by post. In the case of birth registration, the registrar may be required to *see* the child alive (in which case, the child will have to be brought to him, or he will have to go to the child), or he may be able to accept the statement of the informant without visual verification. Finally, the word of the informant may be sufficient in itself, or it may need to be substantiated by that of witnesses.

Exact information is not available on the national practice of countries in regard to these procedures. However, it is known that in Ceylon, for example, upon the payment of a small tax, a written declaration of live birth may be made in place of a verbal one. In the United States, the attendant may mail to the registrar the certificates of live birth. In Czechoslovakia, events occurring in hospitals may be reported in written form. Undoubtedly, some variations of this process exist in other areas also, especially for events occurring in relatively remote areas. The implication of the procedure on vital statistics is based on the fact that written declarations might tend to be less accurate than the verbal, because of the inability of the registrar in such cases to clarify information which might be obscure. The implications of the procedure on the authenticity of registrations are also factors in the question, but they will not be explored here.

With respect to the visual verification of the birth, it is known that in some countries the registrar is authorized to require that the child be presented to him. Among these are Belgium, France, Greece, Italy, Luxembourg, the Netherlands, and Venezuela. Argentina, on the other hand, only requires that the registrar see the child alive — not necessarily in his office. In both these cases, the intent is to make sure that only those children who are alive at the time of registration are registered as live births. Any child who dies before registration can only be registered as "presented without life" or as a death, and this has already been explained as one of the sources of variation in live-birth, stillbirth, and death statistics.

Since the registration record has probative value, it is natural that, lacking visual verification of the event — and even when such confirmation is required — corroborative evidence of witnesses may also be demanded. Thus, it is found that in at least 17 countries (of which 10 are in Latin America), witnesses are required for birth registration, and an equal number of countries have the same requirement for death registration. Marriage registration invariably requires witnesses, while registration of divorce — being made on the strength of the court record — does not often require the secondary confirmation.

The employment of witnesses in registration obviously has no direct effect on statistics. It may, however, tend to delay registration, because of the difficulty of assembling two or three persons in a specific place at a certain time, especially if compliance necessitates absence from usual occupations.

B. Where current registration is made

This element of the process has to do with the geographic place in which the informant must make his declaration. Essentially, there are only two alternatives to this question. Registration can be made in the place where the event occurred, or it can be made in the place where the person involved habitually lived. The first of these is known as "place-of-occurrence" registration and the second "place-of-residence" registration.

1. INTERNATIONAL RECOMMENDATION

Because place-of-occurrence registration appears to provide the best chance of obtaining complete and accurate records as well as prompt provisional statistics, the United Nations has proposed the following as an internationally recommended Principle[2] on the subject:

"210. *Place where registration is to be made*

"(*a*) Each vital event should be registered in the primary registration unit in which it occurred.

"(*b*) The place of residence should always be reported . . . and if the registered event concerns a resident of a locality other than that where the

[1] *Principles for a Vital Statistics System; Recommendations for the Improvement and Standardization of Vital Statistics.* United Nations. Statistical Office. Document ST/STAT/SER. M/19, 26 August 1953. p. 25. (Sales No. 1953.XVII.8)

[2] *Ibid.* p. 8.

event occurred, it may be desirable also to make such arrangements as are required to inform the place of residence of the event."

Although equally good registration has been obtained with place-of-residence registration as with that by place of occurrence, it will be seen below that most countries of the world register vital events in the registration unit in which they occur. The choice of the place where registration is to be made depends on national practice, on local custom, and on environmental factors peculiar to each country, but generally registration in the place of occurrence will facilitate compliance, minimize the chance of error and delay, and increase the utility of the resulting records. This obligation does not preclude arrangements for reallocation of records or notifications to place of residence, or the necessity of tabulating data by place of residence.

There are certain definite advantages to be had from registering an event where it occurs. It might reasonably be assumed, for example, that an event would be more likely to get registered within the legal time limit if it were done in the place where it occurred. The use of vital records for public-health activities at the local level is also facilitated by "place-of-occurrence" registration. This is especially true in cases of death from communicable disease where certain measures must be undertaken without delay in the area from which the death is reported. Registration by place of residence, if different from the place of occurrence, would not only introduce a time lag which could be dangerous in its results, but also would complicate the delineation of the geographic area for control activities. It should also be noted that the police investigation of violent deaths or those taking place under suspicious circumstances depends on place-of-occurrence registration. This is so because of the jurisdictional questions involved, which would make extremely difficult the prompt police actions required if registration were in the place of residence of the deceased.

2. National practice

Table 8 presents the procedure followed for live birth, death, stillbirth, marriage, and divorce in each country.

Table 8. Place Where Registration of Live Birth, Death, Stillbirth, Marriage, and Divorce Must Be Made: 65 Countries, as of 1 January 1950

(Three dots "..." indicate that no information is available.)

Continent and country	*Live birth*	*Death*	*Stillbirth*	*Marriage*	*Divorce*
AFRICA					
Egypt	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
Union of South Africa	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
AMERICA, NORTH					
Canada	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
Costa Rica	Residence	Occurrence	Occurrence	Occurrence	(1)
Cuba	Occurrence	Occurrence	Occurrence	Occurrence	(1)
Dominican Republic	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
El Salvador	Occurrence	Occurrence	(2)	Occurrence	Occurrence
Guatemala	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
Haiti	Occurrence or residence	Occurrence	Occurrence	Occurrence	Residence
Honduras	Occurrence and residence	Occurrence and residence	(2)	Occurrence and residence	(3)
Mexico	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
Nicaragua	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
Panama	Occurrence	(4)	Occurrence	Occurrence	(1)
United States	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
AMERICA, SOUTH					
Argentina	Occurrence	Occurrence	Occurrence	Occurrence	(5)
Bolivia	Residence	Residence	Residence	Residence	(1)
Brazil	Occurrence	Occurrence	Occurrence	Occurrence	(5)
Chile	Occurrence	Occurrence	Occurrence	Occurrence	(5)
Colombia	Occurrence	Occurrence	(2)	Occurrence	(5)
Ecuador	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
Paraguay	Occurrence or residence	Occurrence	Occurrence	Occurrence	(5)
Peru	Occurrence	Occurrence	(2)	Occurrence	(1)
Uruguay	...	...	...	...	...
Venezuela	Occurrence	Occurrence	Occurrence	Occurrence	(1)

(Continued on following page)

Table 8. Place Where Registration of Live Birth, Death, Stillbirth, Marriage, and Divorce Must Be Made: 65 Countries, as of 1 January 1950—*(Concluded)*

Continent and country	*Live birth*	*Death*	*Stillbirth*	*Marriage*	*Divorce*
ASIA					
Burma	Occurrence	Occurrence	Occurrence	(2)	(2)
Ceylon	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
India	Occurrence	Occurrence	Occurrence	(2)	(2)
Indonesia (European population)	Occurrence	Occurrence	Occurrence	Occurrence	(1)
Iran	...	...	...	...	...
Israel	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
Japan	Occurrence	Occurrence	Occurrence	(6)	(6)
Jordan	Occurrence	Occurrence	(2)	Occurrence	Occurrence
Lebanon	(7)	(7)	(2)	(7)	(7)
Pakistan	Occurrence	Occurrence	Occurrence	(2)	(2)
Philippines	Occurrence	Occurrence	Occurrence	Occurrence	(5)
Syria	(7)	(7)	(2)	(7)	(7)
Thailand	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
Turkey	(7)	(7)	(2)	(7)	(7)
EUROPE					
Austria	Occurrence	Occurrence	Occurrence	Occurrence	(1)
Belgium	Occurrence	Occurrence	Occurrence	Residence	(1)
Czechoslovakia	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
Denmark	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
Finland[8]	Residence	Residence	Residence	Residence	Residence
France	Occurrence	Occurrence	Occurrence	Residence	(1)
German Federal Republic	Occurrence	Occurrence	Occurrence	Occurrence	Residence
Greece	Occurrence	Occurrence	Occurrence	Occurrence	(1)
Iceland	Occurrence and residence	Occurrence and residence	Occurrence and residence	Occurrence and residence	Occurrence
Ireland	Occurrence	Occurrence	(2)	Occurrence	(5)
Italy	Occurrence	Occurrence	Occurrence	Occurrence	(5)
Liechtenstein	Occurrence	Occurrence	Occurrence	Occurrence	(1)
Luxembourg	Occurrence	Occurrence	Occurrence	...	...
Monaco	...	...	...	...	...
Netherlands	Occurrence	Occurrence	Occurrence	Residence	(1)
Norway	Occurrence and residence[9]	(10)	Occurrence and residence[9]	Occurrence and residence[11]	Occurrence
Poland	Occurrence	Occurrence	Occurrence	Occurrence	(1)
Portugal	Occurrence	Occurrence	Occurrence	Residence	(1)
Spain	Occurrence	Occurrence	Occurrence	Residence	(5)
Sweden[8]	Residence[12]	Residence	Residence[12]	Residence	Residence
Switzerland	Occurrence	Occurrence	Occurrence	Occurrence	(1)
United Kingdom:					
England and Wales	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
Northern Ireland	Occurrence	Occurrence	(2)	Occurrence	Occurrence
Scotland	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
Yugoslavia	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
OCEANIA					
Australia	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
New Zealand:					
European population	Occurrence	Occurrence	Occurrence	Occurrence	Occurrence
Maori population	Occurrence	Occurrence	Occurrence	(2)	Occurrence

[1] Civil registration in place of marriage registration in addition to usual court registration in place of occurrence.

[2] Not officially registrable.

[3] In place of marriage registration and in place of residence.

[4] In place of burial.

[5] Divorce, in the sense used here, does not exist.

[6] In family ancestral seat (Honseki) of the husband and wife.

[7] In place where [mother] registered in the population register.

[8] Place of residence is equivalent to place where registered in population register.

[9] In place of birth (with registration number) and in parents' place of residence (without number).

[10] In place of burial (with registration number) and in place of residence (without number).

[11] Civil marriages are notified to the pastor at new residence of the married couple.

[12] Actually "parish of birth", which is defined as the parish in which the mother at the time of her delivery was church-registered.

(a) *Live birth*

It will be seen from table 8 that live births must be registered in the place where they occurred in all but nine countries out of 62 reporting. Exceptions are provided sometimes, as for instance in New Zealand where it is noted that in special circumstances where undue delay, difficulty, or expense would be incurred by registration in the place of occurrence, the registrar of another district may register the event. But the majority of the countries (53 out of 62) require place-of-occurrence registration of live births, either alone (50) or in combination with residence (3). Place-of-residence registration, alone or in conjunction with that by place of occurrence, is found in Costa Rica, Bolivia, Finland, Iceland, Norway, Sweden, and Honduras. In addition, Lebanon, Syria, and Turkey require registration in the place of population registration, which is essentially the same as place of residence. It should be noted that only two countries, Haiti and Paraguay, report that live-birth registration may be made either in place of occurrence or place of residence.

(b) *Death*

As with live birth and stillbirth, the overwhelming majority of the countries, 54 out of 62, report that deaths must be registered where they occurred. As with birth registration, Honduras and Iceland provide for dual registration in place of occurrence as well as in place of residence, while Bolivia, Finland, and Sweden specify "residence" and Turkey, Syria, and Lebanon specify place of population registration, which is essentially the place of permanent residence. There is one variation in death registration, however, which is of interest here. It will be noted that in Panama and Norway, registration is made in the place where the burial took place.

(c) *Stillbirth*

Stillbirths are required to be registered where they occurred in 49 out of 52 countries reporting. The exceptions are Bolivia, Finland, and Sweden, which require place-of-residence registration. Iceland and Norway have the requirement for registration at both place of occurrence and residence.

(d) *Marriage*

Despite the fact that in many countries the act of marriage is simultaneous with its registration, the percentage of countries reporting place-of-occurrence registration falls a little for marriages, it being under 80 per cent based on a frequency of 46 out of 58 reporting. Place-of-residence registration is specified in eight countries and registration at place of population registration in four others. It should be noted, however, that in practice "place of residence" for marriages is likely to be the same as "place of occurrence", inasmuch as in some countries, for example Chile, the law provides that marriages must take place in the community where one of the participants has his permanent residence.

(e) *Divorce*

Information is available for 49 out of the 53 countries which have "divorce" in the sense used here. Of these, 24 require place-of-occurrence registration, while 16 require that registration be in the place where the marriage took place. Four countries specify "place of residence" while four others register divorces like marriages in the place where the population register is kept.

Place-of-occurrence registration has a slightly different connotation in connexion with divorces, because of the fact that divorces in many countries are registered only by the court concerned (see tables 1 and 11). In such cases, place of occurrence is the place where the relevant court is situated. The group of 16 countries which register divorces in the place of marriage registration do so because of the fact that divorces are recorded in the marriage register. By this action, the marriage is officially cancelled as a safeguard against subsequent misuse of the marriage record.

3. EFFECT OF VARIATIONS ON STATISTICS

A good example of the delay which might occur when registration is to be made in a place other than that of occurrence may be found in Japan. Legal registration of the marriage normally takes place at the place (*Honseki*) where the family record (*Kosecki*) is kept. Whenever the marriage occurs in a place other than the *Honseki,* it will be necessary to transmit a copy of the declaration to that place. As a result, registration of the marriage is often unduly delayed.

A similar situation occurs in Syria where legal registration of all vital events must take place in the registration office where the population register is kept. Such a system (common also to Lebanon, Turkey, Finland, and Sweden) requires that when the event occurs in another community, declarations be transmitted to the place of residence for registration. This requirement alone may make for delay in reporting and, more important, for omissions and inaccuracies in the registers. Norway and Iceland have solved this need for maintaining the population registers by a dual procedure — primary registration in place of occurrence and secondary registration in place of residence, this being equivalent to a system of notifications between registry offices. Many other countries have solved it with a different registration procedure, separating the maintenance of the civil registers from those concerned with the family and household schedules.

C. Cost of current registration

The question of whether the privilege of registration should be subject to payment of a fee has been of interest to registration officials for a number of years. It will be recalled that, in the beginning, when baptisms, burials, and weddings were registered instead of births, deaths, and marriages, the religious authority who performed these rites or ceremonies was accustomed to receive payment for his services. When registration became a civil function, the same procedure tended to remain. However, with the development of state services, the right of a citizen to have his birth, death, or marriage registered without charge became more general and gradually many countries eliminated the fee.

1. INTERNATIONAL RECOMMENDATION

In recognition of the fact that the registration of vital events is a legal and obligatory function prescribed by the state, and one which should be facilitated rather than hindered, the United Nations has recom-

mended[3] that registration be free. This recommendation is set forth in Principle 211, which is given below:

"211. *Cost of current registration*

"(*a*) The registration of vital events, as prescribed by law, should be free of charge to the person making the registration if provisions of the law with respect to time and so forth are complied with.

"(*b*) As an incentive to registration, it may be desirable in some countries to furnish an initial proof of registration to the informant, without charge."

This recommendation does not preclude the imposition of a fee for late (delayed) registrations, i.e., those effected after the expiration of the statutory period, or for searching of the registers and the certification of true copies. As a matter of fact, it proposes that free registration be provided if all provisions of the law with respect to time and other requirements are met. Thus, the provision of free registration may be used as an incentive for achieving complete and prompt registration. In addition, it is suggested in the Principle that the initial proof of registration may well be furnished free in order to provide another incentive to register. Many countries may not find this second incentive necessary or desirable, but in other cases such a provision may prove very advantageous.

[3] *Ibid.* p. 8.

2. National practice and effect of variation on statistics

Data on the subject of fees charged by various countries have been compiled in table 9.

Table 9. Fee Required for Registration of Live Birth, Death, Stillbirth, Marriage, and Divorce: 65 Countries, as of 1 January 1950

(Three dots ". . . " indicate that no information is available.)

Continent and country	Fee required				
	Live birth	*Death*	*Stillbirth*	*Marriage*	*Divorce*
AFRICA					
Egypt	No	No	No	Yes[1]	Yes
Union of South Africa	No	No	No	. . .	. . .
AMERICA, NORTH					
Canada	No	No	No	No	No
Costa Rica	No	No	No	Yes[2]	Yes
Cuba	No	No	No	No	No
Dominican Republic	Yes	No	No	Yes	Yes
El Salvador	No	No	[3]	No	No
Guatemala	No	No	No	No	No
Haiti	Yes	Yes	Yes	Yes	Yes
Honduras	No	No	[3]	No	No
Mexico	No	No	. . .	No	No
Nicaragua	No	No	No	No	No
Panama	No	No	No	No	Yes
United States	No	No	No	[4]	[5]
AMERICA, SOUTH					
Argentina	No	No	No	No	[6]
Bolivia	Yes	Yes	Yes	Yes	No
Brazil	No	No	No	Yes[7]	[6]
Chile	No	No	No	No	[6]
Colombia	No	No	[3]	No	[6]
Ecuador	No	No	No	No	No
Paraguay	No	No	No	Yes	[6]
Peru	No	No	[3]	No	No
Uruguay	. . .	. . .	. . .	. . .	. . .
Venezuela	No	Yes	. . .	Yes	No
ASIA					
Burma	No	No	No	[3]	[3]
Ceylon	No	No	No	Yes[8]	[3]
India	No	No	. . .	[3]	[3]
Indonesia (European population)	. . .	. . .	. . .	. . .	. . .
Iran	. . .	. . .	. . .	. . .	. . .
Israel	No	No	No	Yes	Yes
Japan	No	No	No	No	No
Jordan	No	No	[3]	Yes	Yes
Lebanon	No	No	[3]	Yes	Yes
Pakistan	No	No	No	[3]	[3]

(Continued on following page)

Table 9. Fee Required for Registration of Live Birth, Death, Stillbirth, Marriage, and Divorce: 65 Countries, as of 1 January 1950—*(Concluded)*

Continent and country	Fee required				
	Live birth	Death	Stillbirth	Marriage	Divorce
Philippines	No	No	No	No	(6)
Syria	No	No	(3)	No	No
Thailand	No	No	No	No	No
Turkey	No	No	(3)	No	No
EUROPE					
Austria	No	No	No	No	No
Belgium	No	No	No	No	No
Czechoslovakia	No	No	No	No	No
Denmark	No	No	No	No	...
Finland	No	No	No	No	No
France	No	No	No	No	No
German Federal Republic	No	No	No	No	...
Greece	No	No	No	No	...
Iceland	No	No	No	No	No
Ireland	No	No	(3)	No	(6)
Italy	No	No	No	...	(6)
Liechtenstein	No	No	No	No	No
Luxembourg	No	No	No	No	...
Monaco	No	No	...	No	...
Netherlands	No	No	No	No	No
Norway	No	No	No	No	...
Poland	No	No	No	Yes	Yes
Portugal	Yes	Yes	Yes	Yes	Yes
Spain	No	No	No	No	(6)
Sweden	No	No	No	No	Yes
Switzerland	No	No	No	No	No
United Kingdom:					
England and Wales	No	No	No	No	No
Northern Ireland	No	No	(3)	No	No
Scotland	No	No	No	No	No
Yugoslavia	No	No	No	No	No
OCEANIA					
Australia[10]	No	No	No	No	No
New Zealand:					
European population	No	No	No	No	No
Maori population	No	No	No	(3)	...

[1] Moslem marriages.

[2] For civil marriages.

[3] Not officially registrable.

[4] In a few states, local official must collect a small fee from participants and send to state.

[5] Generally, no charge for registration by State Registrar, but cost of filing decree locally is usually part of court costs collected from litigant.

[6] Divorce, in the sense used here, does not exist.

[7] Proclamation fee.

[8] For Moslem and General only; no fee is charged for the registration of a Kandyan marriage.

[9] A stamp fee of 25 cents is payable for registration of a Muslim marriage divorce effected at the instance of the husband. No fees payable for registration of other types of divorce.

[10] Information for five States of New South Wales, Queensland, Victoria, South Australia, and Tasmania. A fee is charged in Western Australia, and information is not available for the Capital Territory.

It will be noted that of the 62 countries for which data are available in table 9, only four report that the initial registration of live birth is subject to a fee. These countries are the Dominican Republic, Bolivia, Haiti, and Portugal. For deaths and stillbirths, the situation is essentially the same. Registration of marriage, on the other hand, is subject to a fee in 16 countries out of the 57 for which information is available. These 16 include Egypt, some states of the United States, seven countries in Latin America, four in Asia, two in Europe, and one state in Australia.

It is well known that the recorded marriage rate in certain areas of the world, particularly in Asia and Latin America, tends to be lower than might be expected. One of the factors producing the low recorded rates might well be the requirement of payment for the registration of marriages. In countries where the level of economic development is not high and income is, therefore, proportionately low, the requirement of a fee for civil registration of a marriage might well deter the contracting parties from registering the event. Such marriages would then be classified as "consensual".

Civil registration of marriage may also be deferred or omitted if the religious ceremony uniting the couple has also been subject to a fee. The requirement of a fee thus may be viewed as a factor which might well operate to discourage civil registration of marriages, both consensual and religious. However, although the fee may act as a deterrent to complete registration, it should not be assumed that it is the only or principal factor affecting completeness. Elimination of the fee does not result in complete registration of marriages, as will be seen from the evident incompleteness in the marriage statistics of Panama, Nicaragua, Peru, Guatemala, and Thailand for example.

Table 9 shows that more than any other vital event, divorce registration requires payment of a fee. Specifically, 13 countries out of 43 for whom information is available report that a fee must be paid to effect the registration. This number may even be an understatement because of the practice — not evident from the table except in the case of the United States — of collecting the cost of filing a divorce decree as part of the court costs payable by the litigant. However, since divorces *must* be registered by the court in any event, it is difficult to see how the imposition of a fee for divorce registration affects the completeness of statistics on divorce.

D. Time allowed for current registration

In order to enforce the obligation to register vital events, it is necessary that there be a limit on the time allowed for the informant to comply with the law. It is for this basic reason that almost every national registration law includes a specification on the time allowed for current registration, i.e., a precise designation of the time period within which the informant must make his declaration to the registrar.

1. International recommendation

It is clear that national factors which determine this period in each country are so diverse that no specific international standard could be formulated on this point. But in order to focus attention on this important element of a vital-statistics system, the United Nations has formulated a recommendation[4] in general terms. It reads as follows:

"212. *Time allowed for current registration*

"The maximum period to be allowed between the occurrence and the obligatory registration of a vital event should be determined with respect to all the contributory factors operating in the country and should be as short as is consistent with the facilitating of the current and accurate registration of all necessary facts."

Prompt registration of all vital events, and especially of live births, is important from several standpoints. First, the chance of securing accurate information from an informant decreases with the passage of time. This, as has been pointed out previously, was one of the prime reasons given for recommending the establishment of a registration system for the collecting of data on vital events instead of depending on a survey to gather information long after the event occurred. Facts recalled from memory can never be as valid as data recorded immediately upon their occurrence. Provision of extended periods for effecting registration tends to encourage default or, at best, foster incomplete and inaccurate reporting. It is an axiom that the shorter the period of time which is allowed to elapse between the occurrence of an event and its registration (and the more strict the enforcement of the requirement), the more accurate will be the information obtained.

A second advantage of prompt registration is that it allows the basic record to become available to the public-health authorities at the local level in time for it to be of use as an index to cases in preventive and public-assistance programmes concerned with post-natal care, well-baby clinics, immunization, and crippled children. Without such a register, programmes which depend on case finding might be seriously handicapped, and the public would suffer.

Finally, prompt registration may help to make possible more current statistics on live births, deaths, marriages, and divorces, both at the local and at the national level. It is recognized that many other factors subsequent to the registration process affect the availability of current statistics, but prompt registration is at least the first and essential step.

Notwithstanding the importance of immediate registration in fostering complete and accurate coverage, in providing current case registers, and in promoting current statistics, it is an acknowledged fact that considerations of national topography, climate, communications, culture, and so forth, must have a bearing on the determination of the maximum time periods which should be allowed by law for the registration of vital events. In countries where communications and transportation facilities are poor, where registration offices are far apart, and where seasonal changes bring hardship, registration periods of short duration may only discourage compliance. This is especially true when the expiration of the legal registration time period brings with it a severe fee for late registration and perhaps special court procedures for effecting registration. The need for flexibility in the law governing the time allowed for registration is exmplified by the provisions of certain countries for two periods, one for events occurring in urban or settled areas, and another for those which take place in more isolated parts of the country. The information on this point will be found in table 10 below.

2. National practice and effect of variation on statistics

In order to illustrate the variation in the "time" provision and to investigate whether there is any apparent relationship between the legal length of time allowed for registration and the quality of resulting vital statistics, the statutory time periods allowed by national regulation have been brought together in table 10.

[4] *Ibid.* p. 8-9.

Table 10. Time Allowed for Registration of Live Birth, Death, Stillbirth, Marriage, and Divorce: 65 Countries, as of 1 January 1950

(Three dots ". . . " indicate that no information is available.)

Continent and country	Time allowed				
	Live birth	Death	Stillbirth	Marriage	Divorce
AFRICA					
Egypt	8 days	24 hours	24 hours	(1)	(2)
Union of South Africa	7 and 30 days[3]	24 hours and 30 days[4]	7 and 30 days[3]	7 days	(2)
AMERICA, NORTH					
Canada	10–30 days[5]	(6)	. . .	2–15 days[7]	(8)
British Columbia (Province)	30 days	(6)	30 days	48 hours	1 month
Costa Rica	25 days	24 hours	25 days	(9)	. . .
Cuba	1 year	Immediately	Immediately	5 days[10]	. . .
Dominican Republic	30 and 60 days[11]	1 day	1 day	(1)	60 days
El Salvador	15 days	Same day	(12)	8 days[13]	Not fixed
Guatemala	8 days	24 hours	24 hours	8 days	8 days
Haiti	30 days	24 hours	24 hours	10 days	30 days
Honduras	8 days	24 hours	(12)	(1)	Not fixed
Mexico	15 and 40 days[14]	Immediately	. . .	(1)	. . .
Nicaragua	8 days	24 hours	. . .	5 days	5 days
Panama	8 days	8 days	8 days	Not fixed	Not fixed
United States	1–15 days[15]	3 days[16]	3 days[16]	5–30 days[17]	10–30 days[17]
AMERICA, SOUTH					
Argentina	3 and 8 days[18]	24 hours	3 and 8 days[18]	8 days	(19)
Bolivia	8 days	8 days	8 days	8 days	1 year
Brazil	15 and 90 days[20]	24 hours and 90 days[20]	15 and 90 days[20]	(1)	(19)
Chile	60 days	3 days	3 days	(1)	(19)
Colombia	8 days	Very quickly	(12)	30 days	(19)
Ecuador	10 days	(6)	(6)	10 days	. . .
Paraguay	8 and 15 days[21]	24 hours	24 hours	(1)	(19)
Peru	8 days	24 hours	(12)	(1)	Not fixed
Uruguay	. . .	. . .	. . .	. . .	. . .
Venezuela	20 days	. . .	. . .	(1)	. . .
ASIA					
Burma	1 week	24 hours and 1 week[22]	. . .	(12)	(2)
Ceylon	42 days	5 days	5 days	(1)	(2)
India:					
Madras (State)	2 weeks	4 days	. . .	(12)	(12)
Indonesia (European population)	3 and 10 days[23]	3 and 10 days[23]	3 and 10 days[23]	(1)	6 months
Iran	. . .	. . .	. . .	. . .	. . .
Israel	15 days	24 and 48 hours[24]	15 days	(1)	(2)
Japan	14 days	7 days	7 days	(1)	10 days[25]
Jordan	15 days	3 days	(12)	(1)	(2)
Lebanon	15 days[26]	15 days[26]	(12)	15 days[26]	15 days
Pakistan	4 days	4 days	4 days	(12)	(12)
Philippines	30 days	48 hours	48 hours	15 and 30 days[27]	(19)
Syria	10 and 30 days[28]	10 and 30 days[28]	(12)	10 and 30 days[28]	10 and 30 days[28]
Thailand	15 days	1 day	1 day	. . .	. . .
Turkey	30 days	15 days	(12)	30 days	(2)
EUROPE					
Austria	1 week	1 day	1 day	Day of marriage	Not fixed
Belgium	3 days	(29)	3 days	(1)	2 months
Czechoslovakia	7 days	Following week-day	Following week-day	(1)	(2)
Denmark	2 and 8 days[30]	Immediately after burial	2 and 8 days[30]	Day of marriage	(2)
Finland	6 weeks and 2 months[31]	Without delay	Without delay	(32)	1 week

(Continued on following page)

Table 10. Time Allowed for Registration of Live Birth, Death, Stillbirth, Marriage, and Divorce: 65 Countries, as of 1 January 1950—*(Continued)*

Continent and country	Time allowed				
	Live birth	Death	Stillbirth	Marriage	Divorce
France	3 days	24 hours	3 days	(1)	Not fixed
German Federal Republic	1 week	Next working day	1 week	(1)	(2)
Greece	10 days	24 hours	10 days	30 days	30 days
Iceland	Not fixed	Not fixed	Not fixed	Not fixed	(2)
Ireland	42 days	5 and 14 days[33]	(12)	(34)	(19)
Italy	10 days	24 hours	10 days	(35)	(19)
Liechtenstein	3 days	1 day	3 days	...	...
Luxembourg	3 days	3 days	3 days	...	2 months
Monaco	3 days	...	...	...	...
Netherlands	3 days	5 days	5 days	(1)	6 months
Norway	4 weeks	8 days	4 weeks	(1)	(2)
Poland	2 weeks	24 hours	2 weeks	(1)	...
Portugal	30 days	24 hours	1 day	(35)	5 days
Spain	3 days	1 day	1 day	(1)	(19)
Sweden	6 weeks	Speedily	Speedily	Speedily	3 days
Switzerland	3 days	2 days	3 days	(1)	8 days
United Kingdom:					
England and Wales	42 days	5 days	42 days	(1)	(2)
Northern Ireland	42 days	5 days	(12)	(36)	(2)
Scotland	21 days	8 days	21 days	3 days	(2)
Yugoslavia	15 days	3 days	24 hours	(1)	(2)
OCEANIA					
Australia	42–60 days[37]	7–30 days[38]	(39)	7–31 days[40]	(2)
New South Wales (State)	60 days	30 days	21 days	1 calendar month	(2)
New Zealand:					
European population	62 days	3 and 7 days[41]	62 days	(1)	(2)
Maori population	2 months	(42)	2 months	(12)	...

[1] Registered at the time of the ceremony, no additional action involved.

[2] Officially registered only by authority granting; no additional registration action involved, although notations may be made on marriage records for cancellation purposes.

[3] Seven days in urban areas; 30 days in rural areas.

[4] Twenty-four hours in urban areas; 30 days in rural areas.

[5] Varies among provinces as follows:

Prince Edward Island	30 days
Nova Scotia	30 days
New Brunswick	10 days
Quebec	not fixed
Ontario	30 days
Manitoba	10 days
Saskatchewan	15 days
Alberta	1 month

[6] Before burial permit can be issued.

[7] Varies among provinces as follows:

Prince Edward Island	48 hours
Nova Scotia	48 hours
New Brunswick	7 days
Quebec	not fixed
Ontario	2 days
Manitoba	15 days
Saskatchewan	forthwith
Alberta	3 days

[8] Varies according to province (see British Columbia below).

[9] In theory: civil marriages, same day; religious marriages, shortest time possible. In practice: one month.

[10] For marriages celebrated by notaries; those celebrated by *jueces municipales* registered at time of marriage.

[11] Sixty days for registration if birth occurs where there is no civil registry office.

[12] Not officially registered.

[13] For marriages performed at home of participants; otherwise, at time of ceremony.

[14] Fifteen days if father registers the birth; if mother registers, 40 days.

[15] Within 24 hours of birth in heavily populated areas; up to 10 and 15 days in sparsely populated areas having poor means of communication.

[16] Or prior to the removal or disposal of the body.

[17] Varies among states.

[18] Eight days in National Territories.

[19] Divorce, in the sense used here, does not exist.

[20] Three months for places more than 30 km. distant from the nearest registry office and where railroads do not exist.

[21] Eight days in Asunción; 15 days in rest of country.

[22] Twenty-four hours in the case of areas covered by Municipal Act of 1898; one week in other areas.

[23] Three days if within 15 km. of registrar's office; 10 days if more than 15 km. In case of great distance, registration may be postponed to first opportunity.

[24] Forty-eight hours in places without a health office.

[25] For divorce by court order; divorce by mutual consent, no fixed period.

[26] Law on Registration of Vital Events, 7 December 1951, replaced these periods with the following: live births, 30 days; deaths and marriages, one month.

[27] Thirty days in case of marriage *in articulo mortis* or at distant places, and marriages between neo-Christians.

[28] Thirty days if event occurs where there is no civil register office.

(Continued on following page)

(a) *Live births*

The diversity in the length of the period allowed for the registration of a live birth is immediately apparent from table 10. The shortest period recorded is one day and the longest 90 days — the one-day (24-hour) limit being in force in some heavily populated areas of the United States, while 90 days are allowed in parts of Brazil which are more than 30 kilometres from a registry office and where railroads are not available. Between these limits, however, the majority of the time periods reported for live-birth registration are concentrated at "15 days and below", with more than half of the 65 countries reporting time periods below this limit. Ten countries report variable periods depending on different factors, among which may be mentioned the degree of urbanization of the area where the birth occurred, the proximity of the area to a civil registry office, the identity of the informant (i.e., mother or father), or in Finland the type of registration being made, that is, religious or civil. In addition, the Dominican Republic and Syria recognize the need for adaptation to circumstances, as do Paraguay, Denmark, Finland, the United States, Mexico, and Venezuela.

Examination of the table reveals that there does not appear to be a direct relationship between countries which allow a relatively long period for registration and those which have poor registration of birth in terms of completeness. However, it should be emphasized that the periods set forth in table 10 are the legally designated periods — the statutory time limits given in the Civil Codes or in the vital-statistics laws. They do not reflect the practical modifications made necessary in countries where vital registration is not yet well established as a civil obligation. The extension for practical reasons of the period allowed often results in an actual registration time period of up to one year. Under such conditions, the inferences drawn from the relationship of the legal time periods given in table 10 and completeness of registration can have little validity.

(b) *Deaths*

Inasmuch as death registration owes its development partly to police regulations and to the demands of public-health workers for data on deaths from communicable disease and since death registration is usually a prerequisite to issuance of a burial permit, it is not surprising that, according to table 10, 19 countries out of 61 reporting require death registration within 24 hours, and six others require it to be registered "speedily", "without delay", "very quickly", "the same day", or "immediately". Only eight countries report a period exceeding five days. Thus, the overwhelming majority of the laws require registration within five days of death.

It will be noted that, as with live-birth registration, five countries take cognizance of the fact that the potential proximity of a registration office influences the speed with which registration can be made. In these five countries, namely, the Union of South Africa, Brazil, Israel, Syria, and New Zealand, the period allowed varies from 24 hours in the Union of South Africa, Brazil, and Israel to up to 90 days in parts of Brazil.

The statistical implications of the "time allowed" for death registration would appear to be rather obscure. It may fairly be assumed that the time period allowed is not the dominant factor influencing the completeness with which deaths are registered. In the case of death registration, moreover, the periods given in table 10 are more or less fixed. Such under-registration of deaths as does exist is probably not "delayed" registration in the sense applicable to live births. There is little to encourage late registration of death and, therefore, little inclination to develop extended registration time limits.

(Footnotes to Table 10—Concluded)

[29] Not fixed, except 24 hours for deaths in hospitals or clinics.

[30] Two days in urban areas; eight days in rural areas.

[31] Six weeks for ecclesiastical register; two months for civil registration.

[32] Thirty days for civil marriages; religious marriages are registered at time of ceremony.

[33] Fourteen days if death is medically certified.

[34] Catholic marriages: within three days, in theory; in practice, within the quarter in which the event occurs. All other marriages: registered at time of ceremony.

[35] Civil marriage, at time of ceremony; religious marriage, within five days.

[36] Catholic marriages, three days; all other marriages registered at time of ceremony, except three days are allowed in the case of a special licence.

[37] Varies among states as follows:

New South Wales	60 days
Western Australia	60 days
Queensland	60 days
Victoria	60 days
South Australia	42 days
Tasmania	60 days
Capital Territory	...
Northern Territory	...

[38] Varies among states as follows:

New South Wales	30 days
Western Australia	14 days
Queensland	30 days
Victoria	21 days
South Australia	10 days
Tasmania	7 days
Capital Territory	...
Northern Territory	...

[39] Varies among states as follows:

New South Wales	21 days
Western Australia	14 days
Queensland	not fixed
Victoria	not registered
South Australia	not fixed
Tasmania	not registered
Capital Territory	...
Northern Territory	...

[40] Varies among states as follows:

New South Wales	1 month
Western Australia	14 days
Queensland	30 days
Victoria	immediately
South Australia	7 days
Tasmania	7 days
Capital Territory	...
Northern Territory	...

[41] Three days in a borough; seven days in any other case.

[42] On North Island: two weeks. On South or Chatham Islands: three days in city or borough; seven days in other areas.

(c) *Stillbirths*

Stillbirths are required to be registered in 55 of the countries included in table 10 and of these, information for 46 is available. Out of these 46, there are only two which report a time period for stillbirths which differs either from that for live births or from that for deaths. All of the other countries specify either the time allowed for live births (18 countries), that allowed for deaths (20 countries), or in the five cases where the interval for births is the same as for deaths, that allowed for births and deaths. This means that the time period allowed for stillbirths might have a range covering the extremes of those reported for live births and for deaths, and this is essentially true. Stillbirths are required to be registered "without delay", "speedily", "on the same day", in three countries; "within 24 hours", in ten; and within 62 days, in another. Only three countries provide a flexible period in the case of stillbirths, most likely because stillbirth reporting occurs primarily in hospitals and not in rural or isolated areas.

It is not surprising that in respect of time, stillbirth registration follows so closely the requirements set up for live-birth or death registration. In chapter V, where the informant was discussed, it was seen that in 89 per cent of the countries, stillbirth registration followed the live-birth pattern, while in the remainder, they were registered like deaths. These facts, together with the knowledge that stillbirth statistics are notoriously deficient for a number of other reasons, make it clear that in the case of stillbirth registration the effect of time period on completeness must be negligible.

(d) *Marriages*

Because in many countries marriage is a civil legal contract which, to establish its legality, must be celebrated before a civil officer, it follows that in most countries of the world, registration would tend to be almost automatic at the time of, or immediately following, the marriage ceremony. Of the 56 countries for which information is available in table 10, 25 report that registration is required "on the day of the marriage" or "at the time of the ceremony". An additional seven countries fix a variable period of "immediately" to as long as 30 days, depending in six cases on whether the marriage was celebrated by a civil or a religious authority.

With respect to the implications which the length of the period might have on completeness of marriage registration and hence on completeness of marriage statistics, it may be assumed that in terms of coverage and accuracy, other factors are of much more importance.

(e) *Divorces*

Because the registration of a divorce in many countries is the responsibility solely of the court or the authority which granted it, and since the registration record in such cases is part of the records of the court proceedings, it follows that divorces are likely to be registered soon after the decree is granted. In some countries, moreover, the registration of the divorce, either in the court registry or in the civil registry, constitutes the legalization of the dissolution and, hence, the action tends to be relatively prompt.

Information in table 10 confirms these generalizations. Out of the 65 countries included in the survey, nine do not recognize divorce in the sense used here, two others (India and Pakistan) do not register the limited number of divorces as take place under tribal and community laws, six have no fixed period for registration, and for 11 information is not available; but of the 37 remaining, 18 report that registration is in the hands of the authority which granted the decree, in which case it is assumed that registration takes place without delay and without further notification procedures. Thirteen countries report registration time limits of between three and 60 days, while two allow as much as six months and one allows one year.

It may be assumed that because of the nature of the event and the character of the registration procedure, there is not likely to be incompleteness in divorce registration and certainly the time factor would have little bearing upon it in any case.

E. Delayed registration

Since specific time periods for the registration of vital events have been set by law in each country, it is clear that events registered *after* the expiration of this statutory period necessarily have a somewhat different status from those registered on time, inasmuch as they were "delayed". Various other terms have been applied to such registrations; they have been known as "delinquent", "late", and "belated", but all these terms imply registration after the expiration of a specified time period.

Irrespective of the variations in terminology, the problem of delayed registration is universal. In practice, perfect adherence to the legal time allowance exists in no country. For one reason or another, some events are registered after the period has expired. Some will be registered within a few days or weeks after the termination of the legal period; others may be delayed for years, perhaps until a specific individual need impels registration.

The problems raised by the necessity of providing for registrations made after the legal time period has elapsed are simplified somewhat by the fact that "delayed" registrations occur primarily in connexion with live births. Delay in registering a birth may be due to several causes. Apathy or ignorance may be a factor; but procrastination until an actual need is felt for the record is a more important cause. The uses of a death record, on the other hand, are such that registration tends to be immediate, if at all. With respect to stillbirths, the lack of an incentive to secure a registration record makes it difficult to think of a reason for filing a delayed stillbirth registration, or at least one delayed for any extended period. Marriages and divorces, on the other hand, are usually obliged to be registered at the time of the ceremony or at the granting of the decree, with the result that registration is, in general, not delayed. In view of all these facts, the problem of "delayed registration" becomes primarily one of live-birth registration.

1. International recommendation

In order to clarify concepts and eliminate confusion, it is considered desirable to make a distinction between

vital events which are registered within a relatively short time of their occurrence, thus approximating current registration, and those the registration of which takes place many years after occurrence of the event. The distinction is valid, because it is known that the factors responsible for long and short delay in registration may differ markedly. Neglect of an obligation, temporary inability to comply, apathy, or other reasons, usually result in compliance with the registration law within a more or less reasonable period following the occurrence of the event. But intent to file a fraudulent entry or to falsify details would be more likely to occur some years after the alleged event had occurred, that is, at a time when direct evidence would tend to have disappeared.

Because of these factors, it has been recommended by the United Nations that "delayed" registrations be considered those which can be registered in the usual manner (by the informant and witnesses appearing before the registrar and attesting to the facts) within some pre-determined period not to exceed one year after occurrence but after the time limit for current registration. The registration of those births or deaths which occurred *more than one year before* and which, therefore, requires affirmation by affidavits, documentary proof, or court appearance, should be known as "declared" registrations. To clarify the existing nomenclature and procedures, the United Nations has recommended these definitions in two Principles[5] which read as follows:

"213. *Provision for delayed registration*

"(*a*) Every vital statistics system should recognize the inevitability of delayed or late registration, i.e., those registrations which can be effected through regular registration procedures but which are made after the expiration of the standard registration period.

"(*b*) Provision should be made for registering these events in a way which will discourage repetition, but not discourage registration."

"214. *Provision for registration of 'declared events'*

"(*a*) Every vital registration system should recognize the inevitability of the need for registering 'declared events', such as live births or legally presumed deaths which occurred more than 12 months prior to the current month and/or under such circumstances that the conventional procedures and requirements for registration cannot be met.

"(*b*) Provision should be made to register these declared events upon declaration, which may be made subject to an appropriate fee and substantiation by judicial procedures, documentary evidence and/or affidavits, the type and extent of which to be determined by each country."

The intent of Principle 213 is to standardize the meaning of the term "delayed registration" and to attach to it the concept of registrations made *after* the expiration of the maximum legal registration period, but *before* the law requires additional substantiating evidence. Although the time period within which such registrations can be made is not stated in this Principle, the complementary standard on "declared registrations" (Principle 214) implies that delayed registrations are those taking place within 12 months after occurrence.

[5] *Ibid.* p. 9.

It is expected that almost all registrations which are not wilfully withheld can be effected without hardship within a period of one year of occurrence. Thus, it is recommended that in so far as procedure is concerned, such registrations be subject to requirements very like those employed for truly current registrations so as not to discourage compliance. However, it may be desirable to make some distinction between registration within the statutory limit and delayed registration, possibly by the imposition of a fee for the proof of registration in the second case.

The recommendation on "declared events" (Principle 214) is applicable to live births which occurred a year or more ago and which failed to be registered, as well as to deaths which cannot be proved by examination of the body and which, therefore, are said to be "presumed", according to the individual laws of each country. Both of these occurrences are customarily subject to registration procedures different from those in effect for current registration. The type and extent of evidence required to register legally either a declared birth or a declared death will be established by national law,[6] but efforts should be made to effect all such registrations and to report them statistically. In the last analysis, continuous efforts should be made to achieve a decrease in the number of "delayed" and "declared" registrations by promoting prompt registration.

2. National practice

Because the special provisions made for the registering of live births reported after the expiration of the legal time period often places an onerous responsibility on the would-be informant, the tendency among many countries has been to relax the statutory time requirement. This extension of the time period results in a rather ambiguous "practical" or "working" period during which registration may be made in the usual manner. Such practical periods, which coincide in part with the recommended delayed-registration period, have been established in several countries, of which the six for whom information is available are probably typical. Canada, for example, allows birth registrations to be made in the usual manner for all births reported within one year of their occurrence. Those reported after the legal period, which varies from 10 to 30 days according to the province, but within the first year of age, are known as "late" or "delinquent" registrations, but the process of registration is the same as that for current registrations. Births registered *after* one year are known as "delayed" registrations. Substantiating evidence is required for their registration and a fee is charged.

[6] Attention is called to the United Nations Conference on Declaration of Death of Missing Persons which was held at Lake Success in 1950. The convening of the Conference had its origin in Resolution 369 (IV) of the General Assembly of the United Nations dated 3 December 1949. The Draft Convention which resulted from the Conference provided for "declarations of death of persons whose last residence was in Europe, Asia or Africa who have disappeared in the years 1939-1945, under circumstances affording reasonable ground to infer that they have died in consequence of events of war or of racial, religious, political or national persecution". The effect of the Declaration of Death issued in conformity with the Convention is stated in article 5 to be that "Declarations of death issued . . . in one Contracting State shall constitute in the other Contracting States *prima facie* evidence of death and the date of death until contrary evidence is submitted". (United Nations. General Assembly document A/Conf.1/7, 3 April 1950.)

Greece and Ceylon allow a total of 90 days (three months) during which normal registration may take place; Ireland, like Canada, allows 12 months; and New Zealand, six months. In the United States, definitions vary according to the state, but in spite of the fact that 15 days is the maximum legal period, several states define a "delayed" registration as one which takes place within four years of the occurrence of the birth.

The delayed birth-registration problem in the United States has always been present, but it became acute at the beginning of the Second World War when the demand for certified copies of certificates increased tremendously. Birth certificates were being demanded not only for proof of age in connexion with military service, but also as identification documents to permit employment in defence industries. As a result, state registration services were swamped with demands for certificates, the searching and validation of which absorbed all the resources of the offices, and also raised innumerable questions of the evaluation of evidence submitted with applications for declared registrations. The need for standardization of practice among the states resulted in the adoption in 1941 of certain uniform procedures.

To illustrate the current trend of state legislation on "delayed" registration in the United States, an example of a new regulation in the State of South Carolina may be cited here.[7] It will be noted that a registration made 11 or more days after the date of birth but before the fourth birthday is known as a "belated" registration. Any registration on or after the fourth birthday is to be known as a "delayed" registration.

> "South Carolina adopted new regulations governing the filing of delayed birth certificates on April 23, 1952 . . . [The] State Registrar, reports that since the new regulations have become effective they have not only raised the standards of delayed registration but have stimulated more prompt reporting of current live births.
>
> "The new regulations follow the recommendations of the Public Health Conference on Records and Statistics of 1951, and provide:
>
> "1. Any certificate filed 11 or more days after the date of birth and before the fourth birthday of a child is a belated certificate. Such certificate may be accepted for filing by the State Registrar if it is signed both by the attendant at birth and the mother of the child.
>
> "2. Any birth registered on or after the fourth birthday of a person must be recorded on a delayed certificate of birth and the facts thereon supported by documentary evidence.
>
> "3. Births recorded on a delayed certificate of birth must be attested to by the registrant if 21 years of age or older; otherwise by either parent, or if both parents are dead, by the guardian. In any of these events, the signature must be notarized."

To illustrate the opposite procedure in which strict adherence to the Civil Code is maintained, the case of Italy may be cited. This extract is taken from article 68 of the Civil Registration Regulations of Italy:

> "If the birth is notified later than ten days after it took place, the registrar shall enter the particulars in part B of Part I of the register of births; but the entry thus made shall not acquire legal effect, and no extract or certificate may be issued, until the registration has been declared valid by the tribunal under the statutory correction procedure.
>
> "A registrar who receives a notification of birth after the prescribed time limit must report the circumstances at once to the Royal Procurator, for all necessary purposes, and must insert the decision of the tribunal relating to such notification, when he receives it, in the margin of the corresponding entry." [translated from Italian]

3. Implications of "delayed" and "declared" registrations for vital statistics

The implications of delayed registration for the quality of vital statistics are twofold. In the first place, the extent to which delayed and declared registrations have to be effected, that is, the volume of late registrations, is a partial indication of the incompleteness of registration in past years and some indication of its present status if the period over which these "delays" occurred is taken into consideration.

Many examples might be cited to show the extent of late live-birth registration in various countries; several of them will be found in chapter XII, where they illustrate the distortion introduced in vital statistics if tabulation is by date of registration rather than by date of occurrence (see p. 169 ff.).

The second implication of delayed and declared registration on vital statistics is the danger of inaccurate or even fraudulent entries with respect to items on the record. To safeguard the authenticity of the records, it is proposed in Principle 214 that documentary proof of dates and places be required for initiating the process of declared registration, and court procedures may also be involved. The need for such protective procedures is acknowledged, but it should also be recognized that the difficulties of complying with the regulations, especially if they involve expensive court procedures, may have the effect of discouraging registration. In Lebanon, for example, the legal registration period has been increased from 15 to 30 days, because it was believed that *mukhtars* who failed to register an event within the 15-day period, wilfully neglected to file a delayed registration because of the expense and inconvenience incurred by the required court procedures. The legal requirements must, in every case, be balanced against practical considerations before a satisfactory solution can be achieved.

[7] "New Regulations for Delayed Registration". *The Registrar*. Federal Security Agency. Public Health Service. National Office of Vital Statistics. Washington, Vol. 17, No. 7, 15 July 1952. p. 26.

CHAPTER VII

THE REGISTER AND THE REGISTRATION RECORD

In chapters V and VI, the role of the "registrar" and the "informant", as well as the process of "registration", was discussed. Mention was made there of the "register" and "registration record", and in this chapter, an attempt will be made to set forth the general characteristics of such records together with the effect that variations might have on the problems of their preservation and use as legal documents and as a source of vital statistics.

The "registration record" has been defined by the United Nations[1] as "the legal document which attests to the occurrence and to certain characteristics of a vital event", and the "collection, list or file of [these] records arranged according to some filing scheme" has been defined as a "register". The specific form and content of the legal registration record and, therefore, of the register is usually fixed by law in each country. But the form itself has little direct bearing on vital statistics because, in most countries, vital statistics are derived not from the registration record, but from a separate statistical report prepared at the time of registration. It will be seen, however, that in practice this statistical report may often be copied from the register long after the departure of the informant. There are, therefore, certain principles concerned with the characteristics of registers and the individual registration records which need consideration. The preservation of the records and the methods employed for finding a specific entry in the register are also subjects of interest. The practices of the various countries for which information in respect of these elements is available will be discussed below.

[1] *Principles for a Vital Statistics System; Recommendations for the Improvement and Standardization of Vital Statistics.* United Nations. Statistical Office. Document ST/STAT/SER. M/19, 26 August 1953. p. 25. (Sales No. 1953.XVII.8)

A. Types and characteristics of registers

1. BASIC TYPES OF REGISTERS

With respect to "type", all registers fall into one of two classes. The original registration may be made in a book-type register, or it may be made on individual records which together form a loose-leaf type of register. The book-type registers may be further subdivided into those which allow an entire page for the inscription of items of information regarding a vital event, as exemplified by the register for Chile, and those which, like the register in Scotland, provide for the registering of several vital events on the same page. The multi-unit page might, for convenience, be known as the ledger-type register, while the former might be called a page register. In the ledger-type register, the items or questions to which answers are required are arranged along the top (box-head) of the page. The answers relative to a number of registrations are then entered on separate lines or spaces under these headings. The page register, on the other hand, may provide for insertion of information in a printed standard text or simply a descriptive dissertation based on a model form.

(a) *National practice*

In order to set forth clearly the type of registers employed by the various countries, table 11 has been prepared to show, for 65 countries, whether a book or an individual record register is used for the registration of live birth, death, stillbirth, marriage, and divorce.

Table 11. Type of Record Used for Registering Live Births, Deaths, Stillbirths, Marriages, and Divorces in Civil Registers: 65 Countries, as of 1 January 1950

(Type of record used by ecclesiastical or judicial authorities not included.
Three dots ". . ." indicate that no information is available.)

Continent and country	*Live birth*	*Death*	*Stillbirth*	*Marriage*	*Divorce*
AFRICA					
Egypt	Book	Book	Birth and death books	Religious court records	Court records
Union of South Africa	. . .	. . .	. . .	. . .	Court records
AMERICA, NORTH					
Canada	Individual	Individual	Individual	Individual	Individual[1]
Costa Rica	Book[2]	Book[2]	Death book[2]	Individual	Marriage book
Cuba	Book	Book	Book[3]	Book	Marriage book
Dominican Republic	Book	Book	Birth book	Book	Book
El Salvador	Book	Book	(4)	Book	Book[5]
Guatemala	Book	Book	Birth and death books	Book	Book
Haiti	Book	Book	Birth book	Book	Book
Honduras	Book	Book	(6)	Book	Book[5]
Mexico	Book	Book	Birth and death books	Book	Book

(Continued on following page)

Table 11. Type of Record Used for Registering Live Births, Deaths, Stillbirths, Marriages, and Divorces in Civil Registers: 65 Countries, as of 1 January 1950—*(Concluded)*

Continent and country	*Live birth*	*Death*	*Stillbirth*	*Marriage*	*Divorce*
Nicaragua	Book	Book	Birth and death books	Book	Book[5]
Panama	Book	Book	Birth and death books	Book	Marriage book
United States	Individual	Individual	Individual	Individual[7]	Individual[7]
AMERICA, SOUTH					
Argentina	Book	Book	Death book	Book	(8)
Bolivia	Book	Book	Book	Book	Marriage book
Brazil	Book	Book	Birth and death books	Book	(8)
Chile	Book	Book	Book	Book	(8)
Colombia	Book	Book	(9)	Book	(8)
Ecuador	Book	Book	Death book	Book	Book[5]
Paraguay	Book	Book	Death book	Book	(8)
Peru	Book	Book	(9)	Book	Marriage book
Uruguay	Book	Book	Death book	Book	...
Venezuela	Book	Book	Birth and death books	Book	Marriage book
ASIA					
Burma	Book	Book	Birth book	(10)	Court records
Ceylon	Book	Book	Book	Book	Court records[11]
India:[12]					
Madras (State)	Book	Book	Birth and death books	(10)	(10)
Indonesia (European pop.)[13]	Book	Book	Death book	Book	Marriage book
Iran	Book	Book	Death book	Book	Book
Israel	Individual	Individual	Individual[14]	Individual	Individual
Japan	Individual	Individual	Individual	Individual	Individual
Jordan	Individual	Individual	(9)	Religious court records	Court records
Lebanon	Book	Book	(9)	Book	Book
Pakistan:[12]					
Punjab (Province)	Book	Book	Birth book	(10)	(10)
Philippines	Individual	Individual	Individual[15]	Individual	(8)
Syria	Book	Book	(9)	Book	Marriage book
Thailand	Individual	Individual	Individual[15]	Individual	Individual
Turkey	Book	Book	(4)	Book	Court records
EUROPE					
Austria	Book	Book	Birth book	Book	Marriage book
Belgium	Book	Book	Death book	Book	Marriage book
Czechoslovakia	Book	Book	Birth book	Book	Court records
Denmark	Book	Book	Birth book	Book	Court records
Finland	Book	Book	Birth and death books[16]	Book	Population register
France	Book	Book	Death book	Book	Marriage book
German Federal Republic	Book	Book	Death book	Family book	Court records
Greece	Book	Book	Birth book	Book	Marriage book
Iceland	Book	Book	Birth book	Book	Court records
Ireland	Book	Book	(9)	Book	(8)
Italy	Book	Book	Birth book	Book	(8)
Liechtenstein	Book	Book	Birth book	Book	Marriage book
Luxembourg	Book	Book	Death book	Book	Book
Monaco	Book	Book	...	Book	...
Netherlands	Book	Book	Death book	Book	Marriage book
Norway	Book	Book	Birth book	Book	Court records
Poland	Individual	Individual	Individual[14]	Individual	Marriage book
Portugal	Book	Book	Death book	Book	Marriage book
Spain	Book	Book	Book[3]	Book	(8)
Sweden	Book	Book	Birth book	Book	Population register
Switzerland	Book	Book	Birth book	Book	Marriage book
United Kingdom:					
England and Wales	Book	Book	Book	Book	Court records
Northern Ireland	Book	Book	(9)	Book	Court records
Scotland	Book	Book	Book	Book	Court records
Yugoslavia	Book	Book	Birth book	Book	Court records
OCEANIA					
Australia	Book	Book	Birth and death books	Book	Court records
New Zealand	Book	Book	Birth book	Book	Court records

(For footnotes see following page)

It will be apparent from table 11 first that live births, deaths, stillbirths, and marriages are registered in book-type registers in most countries of the world, while an individual or loose-leaf register is used in only eight out of the 64 countries for which information is available. Moreover, although not apparent from the table, in 31 out of 50 cases, the book register is the single-page type which provides a full page to each registration.

For divorce registration, the picture is somewhat unclear, inasmuch as the registration of a divorce, in 17 countries, is part of the court records, and the actual forms are not available for study. But among the countries in which divorces are registered by the civil registrar, 28 report registration in a book as against five using the individual record type of registration.

(b) *Effect of variation on records and statistics*

The reasons for the preference among countries for the book register are easily understood. Vital records are legal records of great value. Historically, their preservation has been a matter of grave concern, inasmuch as they must serve as reference records for all time. The original ecclesiastical registers were in the form of a book and, for this historic reason as well as for safe keeping, the method has been retained. This type of record-keeping provides security for the individual records not given by the "loose-leaf" type register, but it does complicate to some degree the problem of filing and indexing. When the original loose-leaf records comprise the register, they may be filed in any sequence desired, that is, by name, by date of occurrence, or by date of registration. Registration in bound volumes automatically determines the method of filing, i.e., by date of registration.

In the countries where the physician or the undertaker rather than the parent or relative is the informant, there are other practical problems. In this case, supplies of individual certificate forms are usually distributed in advance to physicians, midwives, funeral directors, and so forth, in order to facilitate their reporting. These certificates, when filled out and signed, are returned to the registrar and usually constitute the official registration. This procedure for registration could not be used with a book-type register.

(Footnotes to Table 11)

[1] Certified copies of court records are registered by the Registrar of Births, Deaths and Marriages in most provinces (see Table 1, note 4).

[2] Beginning 1953 for births and 1951 for deaths, individual "certificates" of birth and death are being used. The new forms consist of three parts, one of which becomes the original registration record, the second goes to the central Registro Civil, and the third to the Dirección General de Estadística y Censos, accompanied by a "Medical certificate of birth or death for those which had medical assistance". Both a birth and a death certificate are completed for a stillbirth under the new system.

[3] Special book of *fetos* or *abortos*, in which foetuses born without life (stillbirths) and infants who did not survive 24 hours, are recorded without formality of official *Acta*.

[4] Registration in the civil register is not compulsory, but such registration as takes place is made in the birth and the death register.

[5] Plus notation on original record of marriage to the effect that marriage is dissolved.

[6] Registration in the civil register is not compulsory, but such registration as takes place is made in the live-birth register with marginal note.

[7] Marriage licence and court records, but for marriage in three fourths of the states and for divorce in one half of the states, there is provision also for filing a copy or a transcript with the State Registrar of Vital Statistics.

[8] Divorce, in the sense used here, does not exist.

[9] Registration in civil register is not compulsory.

[10] Civil registration of marriage not compulsory for bulk of population (see Table 1, notes 13, 17, 21). Divorces are not recognized except under tribal laws and customs.

[11] For General and Muslim marriage divorces. Kandyan marriage divorces are granted and registered by provincial and assistant provincial registrars.

[12] Registration of births and deaths is compulsory only under municipal and state Acts (see Table 1, notes 16 and 20). There is no compulsory registration of marriage and divorce (see note 10 above).

[13] Civil registration of live births, deaths, stillbirths, marriages, and divorces is not compulsory for the Indonesian population, but only for "Europeans" and Chinese, who constitute about 10% of the population. Marriages and divorces of Moslems are registered at the mosques.

[14] Same form as used for live birth, indicating whether child was born dead or alive.

[15] A birth certificate and a death certificate.

[16] In ecclesiastical birth register and civil death register.

2. Characteristics of registers

Because the actual type of the register is of little importance from an international viewpoint and has slight implications with respect to vital statistics, the United Nations has deemed it inappropriate as the subject for an international recommendation. The recommendation which has been promulgated deals with related points, namely the advisability of maintaining separate registers for each type of event and the need for uniformity and national standardization.

(a) *Separateness of registers*

International recommendation. The quality of separateness is one of the important characteristics of registers. The United Nations has included a specific recommendation[2] on this point in the principle on form and content of the registration record (Principle 215); it reads as follows:

"215. *Form and content of the registration record*

"(*a*) Separate registers should be maintained for each type of event on which data are to be collected by the registration method. . . ."

Many considerations have been taken into account in establishing this Principle. Among the most important might be cited the potential decrease in accuracy of records and statistics as a result of not maintaining a sharp distinction between events registered. When more than one type of event is entered in the same register, some system of notation must be employed to distinguish one from the other. Systems of notation, however carefully designed, are not infallible. There may be failure on the part of the registrar to enter such a notation, he may inadvertently identify an event incorrectly, or he may overlook the notation in transcribing information for statistical purposes. Strict separation

[2] *Ibid.* p. 9.

of registers will avoid the risk of incorrect registration and will do much to safeguard statistics against this source of error.

A second disadvantage in using one register for two types of events is the possibility of a decrease in quality of data as a result of overburdening one register with items of information inappropriate to the subject or, more likely, the failure to obtain important information because of the limitations of the register being employed. The fewer items for which data are required, the better the chance of obtaining complete and accurate information. Burdening a record with information applicable to only a few of the events being registered will certainly tend to lower the quality of the response. Certain items, not being uniformly applicable, may easily be forgotten, and lack of practice will tend to make the registrar less efficient in asking them. Conversely, the categories of information required for one type of event are almost certain to be inadequate or inappropriate for a different event.

Still a third point to be considered is the potential loss in efficiency resulting from lack of separate registers. The idea of a register pre-supposes the copying into a book or onto a separate form of identical information for each event. Uniformity of the information required to be entered tends to improve the efficiency and completeness with which it is entered. If the registrar has to deliberate on whether the item under consideration is applicable to the event he is registering, his efficiency and accuracy will be impaired. Moreover, the use of the register as an automatic and easily obtained summary of the number of each event registered during a specified period is difficult when two different events, such as foetal deaths and live births, are entered in the same register.

Thus, it may be said that separate registers for each type of event tend to promote accuracy in the registers and in statistics, to stimulate completeness and accuracy in individual items of information, and to develop efficiency of operation in registering and reporting for statistical purposes.

National practice and effect of variations on records and statistics. Most civil codes provide that there shall be a separate register maintained for live births, deaths, and marriages, and for certain other vital events the occurrence of which is registrable under the law. It will be seen from table 11 that in all countries, separate registers are indicated for live births, deaths, and marriages, but the same is not necessarily true for stillbirths and divorces.

Stillbirths, for example, are registered in a stillbirth register, that is, in a book or on forms provided specifically for this purpose, in only 10 countries of the 53 for which information is available, namely in Canada, the United States, Bolivia, Chile, Ceylon, Japan, Spain, England and Wales, Cuba, and Scotland. Among the other countries shown in table 11, 18 use the live-birth register for stillbirth registration, 13 use the death register, and 12 enter a stillbirth in both the birth and death register.

Recognition of the problems raised by this use of duplicate registers led the World Health Organization Subcommittee on the Definition of Stillbirth and Abortion[3] at its first session in 1950 to recommend that:

> "Both birth and death certificates should not be required for registration of any foetal death; a single foetal death certificate should be sufficient."

This recommendation, referring specifically to foetal deaths, is consistent with the general United Nations recommendation on separate registers.

In at least 17 countries, civil registration of divorce is made in the marriage register on the basis of the transcripts of decrees received from the courts. Apparently, the registration consists of a simple notation in the margin of the marriage record, comprising the date of the decree and the authority granting the dissolution. In Sweden, a similar type of registration is made, but the notation is made on the "personal record" rather than on the marriage record.

From the point of view of accuracy in statistics, this lack of separateness for the divorce register is not so dangerous as it is in connexion with stillbirths. There is little risk of incorrect registration and of including divorces in statistics of marriage, since the registration of the divorce is a notation on the marriage record and not an individual entry in the register. Such a procedure will not complicate unduly the summary counting of the events unless the notation is overlooked. However, if statistics of divorce are based only on the marriage record with its supplementary notation, it is obvious that the information available would be far from adequate in respect of divorces and, for this reason, the principle of separate registers is recommended for divorces also. The maintenance of separate registers does not, of course, preclude the supplementary notation on the marriage record as a cancellation procedure.

(b) *Uniformity — national standardization*

Irrespective of whether separate registers are maintained for each event or whether the register takes the form of a book or a file of individual documents, there should be national uniformity of the type and content of the register and, for practical reasons, also of size and format.

International recommendation. So essential is this characteristic considered that it has been made the subject of a specific recommendation in the *Principles for a Vital Statistics System.*[4] The recommendation is set forth as part of Principle 215, and is the following:

> "215. *Form and content of the registration record* (continued)
>
> "(*b*) In order to ensure uniformity throughout the country, the form and content of the registration record should conform in basic context to a national standard established by the national agency which controls or co-ordinates registration. Such standardization should not, of course, prejudice the right of sub-national authorities to add important items of local interest or administrative value. . . ."

The desirability of establishing a national standard in respect of the registers is based on the need to obtain at least a minimum of uniform data for every segment

[3] World Health Organization, *Technical report series*, No. 25. p. 14.

[4] *Principles for a Vital Statistics System, op. cit.* p. 9.

of the population in every geographic part of the country. Not only is it advantageous for the legal record of a vital event to be nationally uniform but the content and definitions employed in the register also influence directly the corresponding items on the statistical report, and the necessity of standardization in this respect cannot be over-emphasized.

In addition to the statistical aspect, it should not be overlooked that instructions to registrars for maintenance of registers can be more effective if they are uniform. Moreover, the filing of the records, or of the registers themselves, can be simplified and improved if the registers are uniform in respect of size and shape.

Methods of achieving uniformity. As noted above, the form and content of the registration record are usually fixed, or at least suggested, by the civil code or vital statistics act. This statutory definition is an advantage in so far as maintenance of national uniformity is concerned, but it may also be a limitation unless provision is made for convenient revision of the forms.

But aside from the legal questions, uniformity of size, shape, and content of registers can be obtained by controlling the printing and issuance of supplies in countries where the organization for registration is either centralized in, or directed by, a central agency. In Ceylon, for example, all register books are issued by the Registrar General's Office; each book is prenumbered by pages, and each registrar is responsible for those issued to him. Such control is desirable in order to enforce uniformity, but it has one limitation. This is the possibility that centralized control of printing and issuance may result in local offices being faced with periods when their supply of forms is exhausted and the replacements are slow in arriving. In such cases, the local office is sometimes forced to resort to filling up blank pages with a facsimile of registration records until such time as the official record forms arrive. To avoid such difficulties, printing may be decentralized geographically, or precautions must be taken to ensure that supplies are constantly available at headquarters and that they are sent in time so that the local areas are not left unsupplied. Naturally, there must also be a parallel control which ensures that requests for supplies are made far enough in advance to allow for delivery.

In contrast to the centralized control outlined above, there is the situation which prevails in the countries whose form of government is the federated type. Such countries as the United States, Canada, Australia, and Argentina cannot control the form of the registers, because each autonomous political entity retains this responsibility. In such cases, uniformity of form, shape, size, and content can only be achieved through co-ordinated action — action which is based on recommendations made by central co-ordinating authority. Usually, such recommendations take the form of a model register or form including standard items but drawn up with the understanding that its adoption does not prejudice the right of the constituent units to add such other items and instructions as they may consider desirable in the light of their needs and their peculiar registration regulations.

An example of this type of procedure may be found in the registration system of the United States. Here, the model or standard certificate is revised each 10 years after extensive consultations with the individual states. Each state adopts the Standard Certificate, but in most states, additional items — primarily of a medical character — are added. Moreover, the size and shape of the certificate may vary considerably from state to state. This type of variation would be important in countries where a duplicate of the registration record is the statistical report, and such is not the case in most of the countries in which the control of registration is a sub-national rather than a national function. In the United States, the statistical report on a vital event is either a standard transcript form or a microfilm image of the registration record. In Canada, it is a microfilm image; in Australia and Argentina, it is a "list" report. In each case, general uniformity of content is achieved by the model-form approach, but the size and shape of the original record have no direct bearing on the national statistical report.

(c) *Completeness and accuracy of data*

The information in the registers must be as correct, complete, and legible as the registrar can make it. Accuracy is essential not only because the information recorded at the time of registration becomes the legal document but because it is also the foundation of vital statistics. Errors incorporated at the registration stage will either be perpetuated, or they will be the cause of complicated correction procedures which are detrimental to the records and troublesome to the individual concerned.

Illegible records are as much to be avoided as incorrect information. Unless the data in the record can be understood readily and correctly, there will be danger of erroneous interpretation as the record is deciphered by various individuals for different purposes. The need for legibility is particularly important in respect of names, addresses, and the identifying characteristics required for indexing, not only for ease of indexing but to obviate the possibility of duplicate registrations.

The methods which the registrar may use to increase the accuracy and completeness of data inscribed in the registers are several. Some countries, one of which is England and Wales, follow a procedure whereby a preliminary draft of the information is filled out first. Upon completion of this draft, which later is used as the statistical report, it is presented to the informant, and he is requested to read it and verify its correctness, affixing his signature as proof of his approval. Only after the draft has been verified is any item of information copied into the official register. Similarly, in Czechoslovakia, the statistical report must be completed before any entry is made in the register. Such a procedure tends to guard against incorrect entries and, thereby, diminishes the possibility that changes and corrections will be required in the future.

In countries where the informant comes in person to the register office and is interrogated by the registrar, the practice of completing a preliminary draft is feasible and in fact useful, because this draft can serve as the statistical report also. However, in countries where registration is the responsibility of a secondary informant who need not come to the office in person, this scrutiny and verification is not possible and an alternative device must be sought. One substitute procedure, used in some states of the United States where the

physician is responsible for registering the birth, is that of mailing to the parent a notification of the birth registration. This notification may take the form of a photostat copy of the birth record filed by the physician, or it may be a special form designed for the purpose. In either case the parent, on receipt of the notification, is supposed to check the information included therein and notify the registrar of any corrections or additions which should be made in the record.

The problem of obtaining correct information on every question or item in the register is often a troublesome one. Where the informant is the person most closely concerned with the event, the registrar can repeat the questions until he is satisfied that no additional information will be forthcoming. Where the informant is an intermediary person, as for example the physician, undertaker, *mukhtar,* and so forth, the problem is somewhat more complex. In such cases, the registrar must decide if the submitted information constitutes a satisfactory record, that is, one acceptable for registration. Standards of acceptability may vary but, in general, at least the essential legal items should be completed on the record before the registrar should accept the record for filing. Obviously, the record cannot be rejected if it can be proved that every effort has been made to secure the required information. But, on the other hand, it must be emphasized that it is the registrar's duty to guard against fraudulent entries and, to do this, he must satisfy himself as to the authenticity of the document and ensure that it meets certain standards of acceptability.

3. Contents of registers

(a) *Items on each register*

The extent and nature of the items of information which appear on the registration records are governed by two elements: (1) the civil code or registration law which often specifies exactly what shall be asked of the informant, and (2) the requirements of users of statistical data, i.e., of public-health workers and demographers, in the cases where the registration form alone is the source for statistical data.

International recommendation. The rigidity of civil registration laws in respect of the register's content is not subject to modification without change of the legislation and, in most cases, there is no need to amend the items in the register because, for statistical purposes, additional data may be collected independently. But, in the areas where the registration record has a limiting effect on the data available for statistical purposes by virtue of being the only source of information, the needs of the consumers will need to be taken into consideration in determining the scope of the register. For this contingency, there is an international recommendation on content which makes clear the need for considering not only the legal purposes of vital records, but their statistical use as well.

The Principle[5] which contains the recommendation is 215 on *Form and content of the registration record,* and the pertinent paragraph reads as follows:

". . . (*c*) When the registration record is the original and only source of information for statistical purposes, provision should be made for obtaining the items listed in Principle 308 (*d*)."[6]

National practice. Because registration items have a legal genesis and since, except in a few cases, they have little bearing on statistics, it is not essential here to analyse in detail the items shown on the various registers. But a brief review of the registration records of 65 countries reveals that the information required for registration of a live birth falls into eight clearly defined categories, namely:

Characteristics of the birth or the infant;
Characteristics of the mother;
Characteristics of the father;
Characteristics of the grandparents;
Characteristics of the attendant at birth;
Characteristics of the informant;
Characteristics of the witnesses;
Characteristics of the registrar.

The document which constitutes the legal death registration includes:

Characteristics of the deceased;
Cause of death;
Characteristics of the parents;
Characteristics of the attendant;
Characteristics of the informant;
Characteristics of the witnesses;
Characteristics of the interment;
Characteristics of the registrar.

It should be noted that not only a declaration of the death and particulars concerning the deceased are included but also, in most countries, a statement of the cause of the death, the declaration of which is usually the responsibility not of the person making the declaration of the fact of death but of the attending or examining physician whenever one is available. Although it has not always been obligatory for doctors to report it, a "cause-of-death" item is almost invariably included among the information to be registered. In the United States, Canada, and the Philippines, where a copy of the register becomes the statistical report, the medical certificate is an integral part of the original registration record. In some other countries, such as Chile, the original medical certificate of death is a separate document which, after transcription into the register, is retained by the registrar. In other countries, for example Ceylon, the registrar receives the separate medical certificate of death from the informant, but after inscribing a cause in the register, he attaches the certificate to the statistical report and transmits it to the statistical authorities. The "cause" inscribed in the register in such cases may be simply "natural causes" to distinguish from accidental or violent causes which might have legal consequences, or it may be the complete cause as given by the physician.

In Switzerland, on the other hand, there is professional secrecy with respect to the cause of death, which means that it is not made known to the registrar and it does not appear in the register. Under this system, the registrar — after registering the fact of death — completes a report for the statistical authorities, including therein all particulars except the cause of death

[5] *Ibid.* p. 9.

[6] Principle 308 (*d*) is the one which sets forth the items which should be collected for statistical purposes. The Principle is given on p. 114.

which is not known to him. This statistical report then is sent to the attending physician who, after inscribing on it the cause of death, returns it in a sealed envelope to the registrar. The registrar, for control purposes, records the return of the report and transmits it, still sealed, to the statistical authorities.

Thus, it will be seen that although a "cause of death" must be inscribed in the register in most countries of the world, the medical certification of cause of death is intended primarily for statistical purposes. The legal interest in cause is principally to differentiate natural from violent deaths and, for this purpose, the entire medical certification is not required.

For stillbirth registration, the frequent use of the live-birth and/or death register results in a rather extensive list of items, which includes not only items especially pertinent to stillbirths or foetal deaths, but others as well. However, the common items can be grouped under the following categories:

Characteristics of the stillbirth;
Cause of stillbirth;
Characteristics of the mother;
Characteristics of the father;
Characteristics of the attendant;
Characteristics of the informant;
Characteristics of the witnesses;
Characteristics of interment;
Characteristics of the grandparents;
Characteristics of the registrar.

The categories of information recorded in the marriage register are:

Characteristics of the marriage;
Characteristics of the bride;
Characteristics of the groom;
Characteristics of the fathers of the participants;
Characteristics of the mothers of the participants;
Characteristics of the officiant;
Characteristics of the witnesses;
Characteristics of the consenter;
Characteristics of the registrar.

Complete information is not available for divorce registers because of the fact that, in so many countries, registration takes place in the court register rather than in the civil register.

Despite the fact that the items on the registers are not primarily statistical, a comparison of those required for the registration of a live birth, a death, a stillbirth, and a marriage with the statistical items shown in tables 13 to 16 would reveal that there is little difference, except that for registration purposes there are additional identification and certifying items. The presence of such information as names, places of residence, witnesses, the informant, and so forth, would be expected in a legal document.

(b) *Definition of items on registers*

Many of the items are such as to require definition, since the terms may be subject to a wide variety of interpretation. How will each registrar interpret these concepts? How will the informant interpret them in answering the registrar? The only method of standardizing interpretation is the provision of instructions to the registrar in order that he, in turn, may instruct the informant.

International recommendation. The importance of providing the registrar with guidance of this type has been recognized in the United Nations *Principles for a Vital Statistics System*[7] where, under Principle 216, the following concept has been set forth:

"216. *Definition of each item on the registration record*

"(*a*) Each item on the registration record should be defined, clearly and unambiguously, in accordance with international standards, national population census practice and vital statistics requirements.

"(*b*) The designated definitions should be printed either on the registration record itself or in the form of separate instructions, in order that they may be available at all times to the registrar responsible for interpreting them."

The essence of this recommendation is that the instructions to the registrar must be simple, precise, and readily accessible. It may be desirable to print the definitions on the registration record itself, although in the case of book registers they may be printed on the cover. Also, separate instructions can be prepared and made readily available for consultation so that the registrar who is responsible for interpretation may, at all times, have at hand an authoritative guide.

The setting up of definitions and standards for registration is a function of the central registration office. However, since most registered data are potentially the basic material of vital statistics, the instructions for recording must also be in absolute conformity with the concepts employed by the statistical authorities. If the statistics, for example, are to refer to "age at last birthday", the registrar must be instructed to either record the complete date of birth or the age at the last birthday; if period of gestation is defined in terms of completed weeks, the registrar should not record months; if tabulation of "usual occupation" is required, "usual" in this context must be defined for the registrar.

It is important that such definitions be co-ordinated not only with those used for vital statistics but also with the definitions applicable to population censuses, to health statistics, to migration statistics, and to other related fields.

B. Record management

The discussion of record management, for purposes of this *Handbook,* will be limited to a brief consideration of the aspects of vital records which have statistical implications. The discussion below does not purport to include full treatment of the broad subject of records administration. It does touch on the problems of record preservation, filing, indexing, correction, and reproduction — all of which have some influence on the statistics produced by the registration system.

1. Preservation of registration records

All the provisions for establishing a registration record with evidentiary value would be of little consequence unless some provision were also made for preserving the documents. In this respect, registration records should be considered as archival papers of which the registrar is the custodian.

Documents with archival or permanent value are susceptible to two general types of injury: (1) the

[7] *Principles for a Vital Statistics System, op. cit.* p. 9.

deterioration due to aging of the components of the records themselves, and (2) the hazards of an external kind such as those due to careless handling, fire, theft, attack by insects, and so forth. With proper custodial care, the danger of complete loss by fire or theft can be practically eliminated, but the deterioration of records from handling and from the aging of the components may result in torn or faded documents which must be replaced.

The process of replacement in itself lessens the value of the document as an original record, because it opens the way to errors of transcription. Moreover, it is time-consuming and, therefore, costly. More important than these considerations, however, is the fact that replacement is not always provided for by the registration law and, in countries where such records are not replaceable, their loss is irrevocable.

To guard against the necessity for replacement of records because of excessive deterioration requires an understanding of the part played by each component of the record, i.e., paper, ink, binding, and so forth. These components are discussed below in terms of standards of quality which make for permanence, and reference is made to detailed studies of the problems and their solutions.

(a) *Components of records*

Paper. Most registration laws specify the grade of paper and the type of ink to be used in preparing legal records. The Civil Register Code of Portugal, for example, specifies in Article 170 that ". . . The paper of the originals shall be white, of first quality, and of the type known in the trade as 17 kg. linen and of a minimum weight of 115 grams per square metre; paper of different quality may be used for the copies, but it must be white, of the type called 12 kg., and must not weigh less than 75 grams per square metre."

Whether the law is explicit or not, it may be pointed out that the best quality of paper and ink which will withstand time and weather without fading or blurring should be used. The selection of the proper paper is governed in part by the use which will be made of the record, i.e., whether it will be handled continually or simply filed, and the required longevity. There are no international specifications for the paper or ink to be used for vital records, but one example of a national standard might be of interest. The United States National Bureau of Standards has classified paper according to strength and purity into four categories: (1) papers of maximum purity for permanent records, (2) papers of high purity for semi-permanent records, (3) papers of fair purity for records requiring moderate longevity, and (4) papers for temporary use. Vital records being permanent records should, if possible, be made on paper of the first category. The United States specifications for this grade of paper in terms of stock, acidity, rosin content, stability, weight and strength, folding endurance, bursting strength and sizing are as follows:

Table B. Specifications for writing paper of maximum purity for permanent records recommended by the United States National Bureau of Standards

Stock	Free from unbleached or ground wood fibres. Alpha cellulose content not less than 90 per cent. Copper number not more than 1.0.
Acidity	pH value not less than 5.0.
Rosin	Not more than 1.0 per cent.
Stability	When heated for 72 hours at 100°C., the alpha cellulose content shall decrease not more than 1.5 per cent, the folding endurance shall decrease not more than 15 per cent, and the copper number shall increase not more than 0.5.

	Kind of paper									
	Manifold		*Bond*				*Ledger*			
Weight in lbs.:										
500 sheets, 25" x 40"	20	25	35	45	55	65	75	85	95	105
500 sheets, 17" x 22"	7.5	9.3	13.1	16.8	20.5	24.3	28.0	31.7	35.4	39.2
Folding endurance:										
Average number of double folds each direction not less than —										
Grade A	160	240	1,600	2,000	2,000	2,000	1,600	1,600	2,400	3,000
Grade B	80	120	800	1,000	1,000	1,000	800	800	1,200	1,500
Bursting strength:										
Average number of points not less than —										
Grade A	16	20	32	40	60	60	63	72	82	88
Grade B	12	16	26	32	40	48	50	58	66	70

Writing and erasure	Bond and ledger papers shall be suitable for writing on with ink. Ledger papers must have good erasing qualities.
Sizing	Bond and ledger papers shall be tub-sized with animal glue.
Testing methods	The testing methods shall be those approved by the Technical Association of the Pulp and Paper Industry. The physical specifications are for a relative humidity of 50 per cent and a temperature of 70°F., which are the testing conditions approved by this Association.

These specifications are discussed in detail in *The Repair and Preservation of Records*[8] and in *The Preservation of Records in Vital Statistics*,[9] both of which should be consulted for an authoritative review of the problems of record preservation.

Ink. Non-blurring ink, resistant to light and age, must be used if the record is to have permanence. As noted by Mr. Kimberly,[9] inks of the ferro-gallo-tannate type possess the correct light and age characteristics, but they unfortunately are harmful to paper. According to this author, tests have shown that ink containing ammonium ammonium oxy-ferri-gallate has no adverse effects on paper.

Binding. Attention must also be given to the selection of the type and quality of binding, and to its preservation, repair, and storage. A very comprehensive treatment of the problem will be found in *The Repair and Preservation of Records, op. cit.*

(b) *Storage*

The condition under which records are kept is probably more important in the long run than the quality of the original paper, ink, and binding, because it is this provision which can guard against the external hazards to which records are subject. Advantageous storage conditions should provide proper protection (1) from light, both natural and artificial; (2) from excessive temperature and humidity; (3) from acids, gases such as sulphur dioxide, dust, and other impurities found in the air; (4) from fungi and moulds; (5) from insects and rodents; and (6) from fire, water, and theft. The methods of achieving optimum conditions for preserving original records and guarding against deterioration from all of these various sources might include the installation of air conditioners to control temperature, moisture, and air pollution; fumigation to guard against insect and rodent damage; and storage in fireproof vaults and in closed containers. All of these considerations are discussed in detail in the references cited previously.

An additional method of permanent record storage must be mentioned. It is the microfilm process by which a copy of the original record is made by photographic procedure on a small size film which, when properly stored, has a life expectancy of many years. Such a method not only safeguards the information on the record for posterity but also simplifies the storage problem in terms of space. It has been estimated, for example, that microfilm storage can result in a 98 per cent saving of space in addition to other advantages such as accessibility of records, protection, elimination of misfiling, and saving of time. A detailed discussion of these attributes, as well as the problems of microfilming as a method of storage for medical records, will be found in *Manual for Medical Records Librarians*.[10]

Fear of the possible destruction of irreplaceable vital records has led many countries to provide for duplicate registers, one of which usually remains at the local level, while the other is sent to the central archives. In Denmark, for example, duplicate registers must be kept, but the regulation goes even further in specifying that the two registers shall never remain under the same roof overnight.

(c) *Repair*

Notwithstanding all the care which may be taken of records, careless handling and poor storage methods may hasten the deterioration of the records to such an extent that repair becomes necessary. The methods of reinforcing the paper and of restoring faded inks are all discussed in the references cited above.

2. Filing

"Filing" in the sense used here means the arrangement of the records in such a way that individual documents may be located if required. Ordinarily the design of a filing scheme depends on a number of considerations. But, in the case of vital records, registration in book registers automatically determines the method of individual record filing. Each page or space in the register is numbered consecutively, and entries are made as they are registered. Records are, thus, arranged by date of registration, except that provision is sometimes made to enter registrations delayed for over a year at the end of the book for the year in question, rather than interspersed with current registration. On the whole, however, a system of book registers implies volumes numbered consecutively, each volume consisting of pages numbered in a similar sequence.

When the register is of the loose-leaf type, the method of permanent filing presents a problem. Obviously, the records being self-contained units might be arranged in a variety of ways. They might first be classified by geographic area; they might be arranged by date of occurrence or by date of registration; they might be arranged alphabetically by name, in which case they would constitute a self-contained name index.

3. Indexing

The test of the efficiency of a filing system is the promptness with which any desired record can be located. With respect to vital records, the filing scheme employed for the original records will naturally have some bearing on the efficacy of the system, but any scheme can be made more efficient by the use of a current index.

The advantages to be derived from a dependable index cannot be over-emphasized. Especially is this true in areas where delayed registration is common and in those where the prompt location of a desired record represents to the public the degree of efficiency with which the office operates. In countries where registration is made in bound volumes, delayed registrations are often made in the current book, that is, by date of registration. In such cases, the lack of an index would mean that the searcher might have to look through a large number of volumes before locating a specific record, if indeed he ever located it. Subjected constantly to such treatment, the records on file may become torn or defaced. Moreover, failure to find a de-

[8] *The Repair and Preservation of Records*, by Adelaide E. Minogue. U.S. National Archives (Bulletin 5). September 1943. 56 p.

[9] *The Preservation of Records in Vital Statistics*, by Arthur E. Kimberly. Department of Commerce. Bureau of the Census. Vital Statistics — Special Reports. Vol. 3, No. 33, Washington, 5 August 1937. p. 153-160.

[10] *Manual for Medical Records Librarians*, by Edna K. Huffman. Chicago, Physicians' Record Company, 1952. Chapter VIII, p. 157-168.

sired record relatively easily may result in a tendency to file duplicate registrations for lack of evidence of prior filing. From the standpoint of accuracy of filing and elimination of duplication, therefore, as well as from the point of view of record preservation, the development and maintenance of a reliable, flexible index is of prime importance in the registration of vital events.

(a) *Methods of making an index*

Manual. There are at least two ways to make an index. The simplest way is the manual method, by which small index cards are prepared and arranged manually. For example, to prepare a live-birth index, one might type or write on the cards the date of birth, the place of birth, the name of the child, the father's name, the mother's maiden name, and the file number of the original registration. The cards, one for each event, may then be filed in the order considered most convenient for facilitating searching. For example, in the case of live births, the cards could be arranged by the name of mother in areas where there are many illegitimate births or where children tend not to be named at the time of registration, or by date of birth, where this information is more widely known. The important objective is to facilitate the ready locating of the original record. Where variations in spelling may present obstacles to location of the record, names are sometimes indexed according to a phonetic system which eliminates to some extent the difficulties of orthography.

Another manual method consists of inscribing in ledger books the pertinent information for each event. This method has tended to be replaced by the card unit system because, in an index volume, it is impossible to follow strict alphabetical sequence in the arrangement. The best that can be done in such an index is to group together all the names beginning with "A", followed by all the "B's", and so forth. The location of one specified name in such an index would require a search of all the pages devoted to the initial letter. Inflexible and limited indexes of this type serve little purpose not served by the original records themselves, except that of protecting the original records from excessive handling.

Mechanical (punch cards). The second method of preparing an index is to transcribe the identifying data to mechanically processed punch cards. The perforated cards can provide a listing of names or dates in any desired order and, with the printed interpretation, they can themselves be used as file cards. This method pre-supposes that the necessary tabulating equipment including at least key punches, verifiers, a sorter and a tabulator or other machine capable of interpreting and listing are available.

The application of the punch-card method to indexing may take two forms: either a new card may be punched with the information required for indexing, or the card used for statistical processing may be designed to include the data necessary for preparing the index. However, it is not always feasible to adopt the one-card method. Alphabetic codes for names and addresses require a considerable number of columns on the punch card, and it is not always possible to make allowance on one card for these space-consuming items, as well as for all the statistical information required. Moreover, the report from which the statistical card is punched may lack certain details required for an index.

Provided that the statistical report is adequate for indexing purposes, the decision as to the advisability of the dual use of the statistical card or the preparation of a separate index card will have to be made on the basis of a number of factors. First among these will, of course, be the optimum utilization of columns on the card which will require study of the statistical tabulating programme in relation to the amount of data necessary for indexing. The quantity of information required for adequate identification, its availability in correct form on the statistical report, and the most efficient method of punching will help to determine whether or not the statistical card can be utilized for preparation of an index as well.

The great advantage of the punch-card method is its ability to produce any number of listings in any desired order. One index may be made according to the name of the child, another by name of mother, still another by date of birth — all prepared from the same card. On the contrary, the typewritten-card system requires duplication of the cards in order to establish more than one type of index or, if lists are typed from the cards, the rearrangement of the cards and subsequent re-typing. Either duplication or rearrangement and typing are time-consuming and thus limited in their applicability.

To summarize, it may be said that the application of mechanical equipment to the problem of indexing has all the advantages of flexibility, accuracy, and speed characteristic of mechanical sorting and listing. Especially when the number of events to be indexed is large, there can be no question as to the advantages of the punch-card method over manual alphabetizing. For simple small-volume indexes, however, the typewritten cards may suffice, because they require only a supply of cards, a typist, and a typewriter, and are thus inexpensive.

(b) *Maintenance of indexes*

By far the most important consideration in installing an index by either manual or mechanical means is that the additions to, and the corrections in, the index be maintained currently and that they be made in such a way that reference is facilitated. Essentially, this means that cards must be prepared currently, and every correction to a record already indexed must be carried over into the index on a continuing basis. Since it is manifestly impractical to correct listings monthly, temporary files of typed cards or punch cards are usually prepared for consolidation into the regular index at the year's end. In most offices, a consolidated 3- or 5-year index is also prepared in order to facilitate the searching when the reported year of occurrence may be in error.

4. Corrections and additions

The method of correcting and supplementing the legal records of vital events is one usually covered in detail in the registration law. An analysis of these regulations reveals that the methods approved for correcting the basic records fall into two classes, one of which is the appending of correct information without indicating changes on the record itself, and the other the actual inscription of revised or additional data on the face of the record. In either case, care must be taken to protect the legal value of the original document by adopting policies on corrections which set high standards of au-

thenticity, especially for items such as date, place of birth, and other identifying information. If the law provides that the face of the document may be altered, care must be taken to avoid making the document thereby illegible. It is desirable that no entry on the original register should ever be obliterated or removed, but simply struck through with a fine line which will allow it to be read easily. It is also important to remember that, where appropriate, corrections and additions should be currently entered in the indexes described above.

5. Confidentiality

Generally, certified copies of the original registrations have been made available upon the request of a person with legitimate interest. The rules and regulations governing who may request and receive copies of records are part of the registration law in the various countries, and their latitude varies from a very broad interpretation in England and Wales, whereby the register is almost a public document, open to inspection by anyone[11] to Czechoslovakia's interpretation which says "Any persons to whom an entry refers or who can prove a legitimate interest may search the registers in the presence of a representative of the Local National Committee (or of the registrar)."[12] [translated from Czech]

These differing concepts regarding the freedom of access to vital records are based on various factors. One pertinent factor relates to the contents of the records themselves, which in turn is dependent on the system employed to extract statistics. In countries where a duplicate or facsimile of the registration record is used for statistical purposes, the registration record might include personal or medical items which, not having legal value, should not be available to general inspection or use. In such cases, it is understandable that the registers would be open only to the person directly concerned or to one with a legitimate interest. In other countries, a supplementary statistical report carries the more or less confidential items of information not required to be registered, and therefore the legal registers may be searched by anyone without fear of improperly disclosing personal information.

[11] "Any person is entitled to search the indexes kept by a Superintendent Registrar, and to have a certified copy of any entry in the register books kept in his office." *Abstract of arrangements respecting registration of births, marriages and deaths in the United Kingdom and the other countries of the British Commonwealth of Nations, and in the Irish Republic,* U.K. General Register Office. London, H.M. Stat. Off., 1952. p. 7.

[12] *Vyhláška k zákonu o verejnych matrikách* (Order Supplementary to the Draft Law on Civil Registration), Part II, Article 17.

(a) *International recommendation*

There can be no universal agreement, however, as to what constitutes "private" or "personal" information and, therefore, no specific, limiting principle with respect to confidentiality of registration records can be set forth. To give guidance, however, the Statistical Commission of the United Nations has recommended[13] that:

"103. *Confidentiality of registration records and statistical reports*

"Confidentiality of personal information on the registration records should be safeguarded by law in so far as consistent with its use for administrative and statistical purposes. The statistical reports should be open to the widest possible legitimate usage consistent with the needs for confidentiality in each country."

This Principle takes note of the right of the individual to expect that information given to the registrar in confidence will be used only for statistical or administrative purposes. While recognizing the importance of maintaining the confidential nature of personal information, the recommendation proposes that the employment of these data for statistical purposes should not be limited unduly.

(b) *Method of preparing copies*

The method of producing certified copies varies according to the status of the records and the equipment available. Copies of records can be made by one of two methods, (*a*) the duplication of the information on the original record by copying it onto a second record by hand or typewriter, and (*b*) the identical reproduction of the original by photographic methods. Obviously, the transcription method by its very nature is more apt to produce errors than the photographic method. Moreover, it takes a longer time to transcribe and verify the information than to photograph it. However, copying may sometimes improve the legibility of the information, although the improvement may involve a personal interpretation of items difficult to decipher in the original script.

The lack of clarity in some original records is one drawback to the use of the photographic system of reproduction. Many original registration records are in such a poor condition, both with respect to physical condition of the record and to the script, that a legible photographic copy is often impossible to make. In such cases, a careful transcript is the only solution.

[13] *Principles for a Vital Statistics System, op. cit.* p. 4.

CHAPTER VIII

THE REPORTING PROCESS AND THE STATISTICAL REPORT

According to the United Nations *Principles for a Vital Statistics System,*[1] statistical reporting is "the transmission of statistical reports on vital events to the agency responsible for compilation of statistics on these events", and the statistical report transmitted is "the record containing the items of information with respect to a vital event, that is, the 'raw' materials systematically arranged, which are required for vital statistics".

It has been shown in chapter VII that, in most countries of the world, the original registration is made in a book — a bound book. Also, it has been pointed out that this registered document is a legal record, subject to certain regulations with respect to custody, confidentiality, and so forth. From the information available, it appears that the registration record cannot itself become a statistical report. Even if it were possible to use this registered document for statistical purposes, it might not be convenient to do so and, moreover, it might not contain all the information required to meet public-health and demographic needs. On the other hand, it contains extraneous information not required for statistical purposes, such as the "name" of the person concerned, that of the registrar, or of the witnesses. Because of the statistical inadequacies of the original registration record, it is customary that a corresponding statistical report be prepared at the time of registration and transmitted to the statistical authorities.

A. Statistical reporting process

The development of a statistical system requires consideration of a number of elements. One must define the observations or units with which the system is concerned, determine the reporting area, place responsibility for reporting, designate the channels or mechanism for reporting, fix the reporting time schedule, and define the form of the report and the extent and type of information to be reported.

1. UNIT OF REPORTING

The units of the vital-statistics system are the vital events, that is, the live births, deaths, foetal deaths (stillbirths), marriages, divorces, and such other events as have been defined as constituting the field of vital statistics. This is in accord with the United Nations Principle 201[2] which further describes these events as those "on which data should be collected by the registration method".

In accordance with this definition of the unit of reporting, the statistical reports are reports of "live birth" or "foetal death", etc., rather than of the "mother" or "father", and of "marriage" and "divorce" rather than of the participants in these events. The units of tabulation are the same events except in the few cases, for example, where "confinements" or "bridegrooms" may be used for special purposes.

2. REPORTING COVERAGE — SCOPE AND AREA

Complete reporting is essential to the production of adequate vital statistics. In order to produce useful vital statistics, the statistical authorities should obtain and process a report on every live birth, death, stillbirth, marriage, and divorce, in other words a report on every unit which has occurred in the area for which the authorities have jurisdiction.

(a) *International recommendation*

So important is this concept of completeness of coverage that it has been included in the *Principles for a Vital Statistics System,*[3] as follows:

"301. *Statistical reporting — coverage*

"A statistical report should be made on every event which is legally registered whether registration takes place within the period prescribed for current registration or is delayed, and irrespective of the procedure by which the legal record is established, that is, whether by regular procedures or as a 'declared event' . . ."

The aim of this recommendation is completeness of reporting, irrespective of all factors except that of the occurrence of the event. Unless such total statistical reporting is a cornerstone of the vital-statistics system, the resulting statistics will always be deficient. The importance of this principle is further substantiated by a supplementary recommendation which states:

"302. *Statistical reporting area — geographic and ethnic aspects*

"(*a*) No geographic area or ethnic group for which registration records are available should be excluded from the statistical reporting area, and emphasis should be placed on statistical recording and reporting of all events which occur, irrespective of the completeness of registration coverage or the extent of data available.

"(*b*) As far as practicable, qualitative or quantitative indications of the degree of completeness of registration should be given for each geographic reporting area."

This Principle relates especially to the tendency on the part of some countries to limit statistical reporting to areas for which they assume registration and reporting are moderately complete. There are several reasons why reports from every geographic area and ethnic group

[1] *Principles for a Vital Statistics System; Recommendations for the Improvement and Standardization of Vital Statistics.* United Nations. Statistical Office. Document ST/STAT/SER. M/19, 26 August 1953. p. 25. (Sales No. 1953.XVII.8)

[2] *Ibid.* p. 6.

[3] *Ibid.* p. 10.

should be collected. One of these is the need for vital statistics, tabulated for every geographic area, which can be used effectively in connexion with plans and programmes for improvement of statistics. The setting up of certain criteria of completeness as a prerequisite to tabulation is an accepted method of improving the adequacy of the resulting statistics, but this should not be a bar to general reporting. Exclusion of an area or a group of the population from the obligation to report will not tend to stimulate completeness of registration or reporting in the area, but rather will act as a depressant.

A second reason for unrestricted reporting is that even fragmentary data for certain areas are better than none, especially as an aid to public-health programmes where the need may be for individual reports or where even approximate figures for small geographic subdivisions are useful.

3. Responsibility for statistical reporting

As was pointed out in chapter V, the civil registrar has a dual responsibility. Not only must he record information with respect to vital events for legal purposes, but he must also prepare and transmit to the statistical authorities a report on each event registered. Thus, the registrar is the keystone of the vital-statistics system.

(a) *International recommendation*

The Statistical Commission of the United Nations has recommended[4] that these responsibilities be spelled out in the definition of the registrar's duties. The Principle on this point reads as follows:

"305. *The registrar — his duties and responsibilities with respect to recording and reporting statistical information*

"(*a*) The legal definition of the responsibilities of the registrar should specify that he has duties with respect to recording and reporting information for statistical purposes in addition to his responsibilities for filing legal records of events.

"(*b*) Whether the specified procedure provides that he transmit to the statistical authorities a duplicate of the original legal record or an independent statistical form . . ., this report should be as complete and accurate as he can make it and the coverage in terms of events occurred should also be complete and timely."

The method which the registrar adopts to carry out his duties of reporting a vital event for statistical purposes may have an important bearing on the accuracy of the resulting data. If the information is written carefully by hand, the statistical authorities will have little difficulty in interpreting the data. Even better results may be expected if the data are typewritten. But if data are reported in illegible handwriting, errors of interpretation are bound to occur. It is the duty of the registrar to make sure that every item of information transcribed by him or his subordinates can be read and interpreted with ease.

The problems of illegibility may be even more important in connexion with cause-of-death reporting. In most countries, the responsibility for certifying the cause of death is usually the physician's, and his certification, though used in part for registration purposes, is mainly a statistical report. The cause written thereon will be coded and classified for statistical purposes. Unless it is able to be deciphered easily, its coding and classifying may be subject to error of misinterpretation, with corresponding inaccuracies in the statistics of cause of death. Despite the importance of this particular segment of information, it is often the most difficult to decipher.

4. Channel of reporting

The channel through which the registrar transmits his reports to the statistical service and the form in which they reach the national level are dependent on a variety of factors. First among these factors is the organizational or administrative pattern of the vital-statistics system. In countries where statistical compilation is the responsibility of a sub-national geographic area, such as a state or province, rather than of the national government, it is evident that the statistical reports on vital events first will pass directly or indirectly from the local registrar to the state or provincial office. At this sub-national office, they may be copied, or compilations made from them before transmission to the national office. In any case, there is an intermediate step between the registrar and the national statistical service. In countries where the peripheral registration offices depend directly from the central government, there may or may not be such an intermediary step.

(a) *International recommendation*

The whole question of "channels" for reporting depends so directly on the administrative arrangements for vital statistics that little can be said here on the merits of one system over another. The Statistical Commission, in general terms, has recommended[5] in the *Principles* that:

"303. *Organization for collection of statistical reports*

"(*a*) Reports on vital events for national statistical purposes should be collected centrally by the agency which is responsible for the statistical compilation.

"(*b*) If it is desirable for sub-national purposes, provision should be made for channelling original statistical reports through, or supplying copies thereof to, local, state or provincial departments of government which may require information on individual reports for statistical or other purposes."

The provision of information to sub-national organs can be accomplished, as indicated, by channelling original documents appropriately or by making duplicates for use at local levels, but the statistical reports should have as their terminal point the central statistical authority. However, the risk of losses in time and coverage which are liable to ensue whenever intermediate steps are involved should be considered.

(b) *National practice*

Complete information on channels of reporting for the countries included in the survey is not available, but it is known that, in the majority of the countries studied, statistical reports on vital events pass directly from the local to the national level and that no intermediary step is involved.

[4] *Ibid.* p. 10.

[5] *Ibid.* p. 10.

An example of a country which lacks direct contact between the local registrar and the national statistician is Burma. In Burma, where vital statistics are a national responsibility but compilation is geographically decentralized, each headman or health officer, who is also the local registrar, reports births and deaths on certificates to either the township office or to the nearest police station. The township office or police station, in turn, consolidates the returns and sends the consolidation, together with the individual foils, to the civil surgeon of the district. The civil surgeon summarizes all reports for the district and forwards this summary report quarterly through the deputy commissioner of the district to the Directorate of Medical and Public Health Services at the national level. At the national level, district summaries are consolidated into a national aggregate. It is worthy of mention that the Burmese Interdepartmental Committee on Vital and Health Statistics, which is designing a reorganized vital-statistics system, has recommended the elimination from the chain of at least one of the transfer points, namely the police station.

In Ceylon, on the other hand, where a strongly centralized organization exists, reports pass unsummarized from the local registrars to the Registrar General by way of the provincial registrars and assistant provincial registrars.

Chile represents the large group of countries which dispense with intermediate channels and arrange for individual statistical reports to be received centrally, directly from the local offices of the *Registro Civil*. In most instances such a centralized system makes possible a unified system of control, which in turn facilitates querying and general compliance with the timely, accurate reporting essential to good vital statistics.

5. Time schedule

The scheduling of statistical reporting is an extremely important aspect of the vital-statistics system, and adherence to a time schedule can be facilitated by the use of printed instructions which set forth the statistical reporting duties of the registrar and specify how often he should report and to whom. The establishment of the schedule is only part of the problem, however. A more important aspect, which will be discussed in chapter XI, relates to the necessity of maintaining strict control over compliance.

(a) *International recommendation*

Both of these concepts have been included in the United Nations Principle[6] on *Control of receipt of statistical reports:*

"304.

"(*a*) Every possible administrative procedure should be employed for controlling the prompt receipt, by the central vital statistical office, of statistical reports from every reporting area, with the object of making possible current tabulations which will be adequate in terms of completeness of geographic and ethnic coverage, timeliness and detail . . .

"(*b*) A strict time schedule should be established, taking into account the characteristics of the country in terms of topography, communications, and so forth, as well as the provisions for channelling original reports or copies thereof to intermediate offices."

[6] *Ibid.* p. 10.

The central vital-statistics office is recognized in this Principle as the collecting agency which has the responsibility for obtaining promptly a statistical report on every vital event which has occurred from every reporting area. The right of the office to insist on, and to control, prompt reporting is based on its obligation to prepare current tabulations of vital statistics adequate in respect to timeliness and coverage and detailed enough to meet the needs.

Not only is it essential that reports be received promptly so that statistical processing can begin, but every delay in reporting decreases the potential effectiveness of the query programme for correcting and completing deficient data. The more time allowed to elapse between registration and querying, the less chance there will be of either locating the informant easily or of obtaining from him corrected or additional information.

To establish a proper time schedule for reporting, it will be necessary to consider not only the theoretical desirability of current reporting but also, from a practical standpoint, the characteristics of the country which may well militate against prompt reporting. Poor communication and transportation facilities, isolation of parts of the country by climatic conditions, and so forth, will all need to be taken into consideration in determining a realistic schedule. The number of intermediate receipts and dispatches of reports should also be a factor in its establishment.

(b) *National practice*

A study of the procedures in a number of countries reveals that by far the greatest number specify that reports to the statistical authorities are due monthly. Several countries schedule reporting on a quarterly basis. Among both types, there may be also a weekly return on births and deaths, a return which is used primarily to produce current provisional figures on natality and mortality. Final national tabulations are, however, based on the results of monthly or quarterly reports from the registrar.

In areas where communications are difficult, it has been noted that variations in the pattern of reporting may appear. In Burma, for example, the schedule of reporting varies with the distance of the village from the nearest police station. The time schedule often varies according to the type of registrar, just as the time allowed for registration varies according to the identity of the informant. For example, Egypt's medical registrars in health-bureau areas are required to report statistically each week, while the tax collectors, who serve as registrars in other areas, are on a monthly schedule.

B. Statistical reports

1. Types — individual and list

(a) *International recommendation*

The United Nations Statistical Commission has recommended[7] that the statistical report be in the form of an individual document and that this form be used consistently throughout a country for reporting of vital events for statistical purposes. The Principle on this point is as follows:

[7] *Ibid.* p. 11.

"307. *Form of the statistical report on a vital event*

"(*a*) The form of the statistical report on a vital event should be uniform throughout a country.

"(*b*) For purposes of flexibility and efficiency, the report should be an individual document which provides adequate space for the response to each item of information required.

"(*c*) With respect to medical certification of cause of death, it is suggested that the form adopted should conform as far as possible to the 'International Form of Medical Certificate of Cause of Death'.*

"*Published in 'Medical Certification of Cause of Death. Instructions for Physicians on Use of International Form of Medical Certificate of Cause of Death' (*Bulletin of the World Health Organization: Supplement 3,* Geneva, Switzerland, 1952, p. 7)."

The only known suggestion given prior to the United Nations recommendation was that of the Inter American Statistical Institute which, at its Second Congress in Bogotá, 16-27 January 1950, passed a resolution which impinges on this field. The text of the resolution is as follows:

". . . That standard certificate forms for recording births, deaths, still births, marriages and divorces, be adopted in each country, and regulations issued to make compulsory the use of such forms."

The resolution speaks of "standard certificate forms for recording births, deaths" etc., the main intent of which was to standardize content internationally. More will be said of the "content" aspect below, but attention is called to the fact that the resolution implies that each country should adopt "certificates", that is, individual forms for recording information and, presumably, for reporting that information statistically.

This single-unit type of statistical report is in contrast to a multi-unit, collective or "list" type of report. The multi-unit report usually takes the "line-schedule" form in which one line or space across a form is devoted to information concerning each vital event. The items for which information is required are set forth in the box-head, and one list may accommodate as many as 25 individual reports. This multi-unit statistical report is analogous to the ledger-type register and, indeed, is often copied directly from it.

The United Nations Principle which recommends individual statistical forms is based on considerations of flexibility and efficiency. These considerations are perhaps more applicable in respect of statistical compilation procedures but there are certain pertinent points which may be noted here.

Efficient spacing. Both the individual and the list-type statistical report contain original data. But the single-unit or individual report can almost always include more items of information than can be accommodated conveniently on the list or line-schedule type, and this is a distinct advantage. On the individual report, moreover, items can be arranged in such a way as to provide more adequate space for the required answers than can be provided on a multi-unit list. There is no question but that the list type is definitely restricted as to the amount of information which can be accommodated adequately in a report of reasonable size.

This particular advantage of the individual report, that of more adequate space, is readily exemplified by the "International Form of Medical Certification of Cause of Death" recently recommended by the World Health Organization; see facsimile, p. 109. The standard medical certificate of cause of death can readily be accommodated on individual statistical reports. But it is obvious that the amount of information required on these certification forms cannot conveniently be incorporated into a list-type report, with the result that, when the reporting form is of the list type, the medical certification — if it is to be adequate — must be a separate document.

Despite its manifest advantages, the individual form alone may not always guarantee adequate spacing. Sometimes a statistical report may be poorly designed in this respect, becoming so small that not only does it not include an adequate amount of data, but it becomes difficult to control in handling. The statistical *tarjeta*[8] of Chile, the *boletas* of Venezuela and Spain, and some of the reports used in the Netherlands and Sweden are examples of reports which, though individual, might be considered inadequate in respect of space if the information is to be reported in detail. Another type of individual statistical report which may crowd the desired information is the punch card on which data from the registers are inscribed manually and often pre-coded in inscription. Such a system is in use in New Zealand, and it was under consideration in Ceylon. The use of the punch card for statistical reporting has several advantages, but it does present a problem of space limitation, especially for cause-of-death information.

Facilitating exchange of reports. The individual statistical report also provides a more convenient means of inter-agency or inter-area transfer of reports as, for example, provision of duplicate reports to the place of residence, or selection and duplication of reports involving certain types of information such as selected causes of death or reports of all plural births. Using individual report forms, the reporting registrars need only duplicate, by hand or photographic means, and forward the reports requested. The receiving area or agency, on the other hand, receives only the reports of interest to it. Moreover, the reports received are in a form which can be handled and filed with ease.

According to the method of filing, individual forms may be made to serve as indexes by name, by cause of death, by residence, etc., as required by the service. Multi-unit list-type reports may be used as a roster of registration numbers, but they cannot serve as an index.

Cost. With respect to cost, the list-type report has one apparent advantage over the individual form, especially appealing in countries operating on limited budgets. This is the factor of apparent low cost per report. The multi-unit report is certainly less expensive to print, less cumbersome to handle, less space-consuming to file and to maintain in archives, and even less expensive to process. The last point is a false advantage since it stems from the fact that this type, as noted above, usually must contain fewer items per report. But if these factors of cost are weighed against the inadequacy in terms of space and limitation in terms of flexibility of processing, it may well be that inexpensiveness is a misleading factor.

[8] It should be noted that the limited *tarjeta* was replaced by more adequate individual statistical reports beginning 1954.

(b) *National practice*

Despite its manifest advantages, the type of statistical report recommended by the United Nations, i.e., the individual, single-unit form, has not been adopted universally. The situation in respect of this factor, as it was in January 1950, is set forth in table 12 below.

Table 12. Type of Statistical Report Prepared by Civil Registrar and Used for Annual Compilation of National Statistics of Live Birth, Death, Stillbirth, Marriage, and Divorce: 65 Countries, as of 1 January 1950

(Two forms are indicated only if contents or destinations differ. Unless otherwise noted, reports are those prepared by civil registrars from data in civil register. Three dots ". . ." indicate that no information is available. For names of agencies which compile vital statistics, using these forms, see Table 2, p. 27.)

Continent and country	*Live birth*	*Death*	*Stillbirth*	*Marriage*	*Divorce*
AFRICA					
Egypt	List[1]	List[1]	List (birth and death)	List[2]	List[2]
Union of South Africa	...	...	...	...	([3])
AMERICA, NORTH					
Canada	Individual	Individual	Individual	Individual	Summary[4]
Costa Rica[5]	List	List	List (death)	Individual	List[2]
Cuba	List[6]	List[6]	Individual	List[7]	List[7]
Dominican Republic	List	List	List	List	List
El Salvador[8]	List	List	List (birth and death)[9]	List	List
Guatemala	Individual	Individual	Individual (birth and death)	Individual	Individual
Haiti	List[10]	List	List and summary[11]	([12])	([12])
Honduras	List	List	List (birth)[13]	List	List
Mexico	Individual and list[14]	Individual and list[15]	Individual[16]	Individual and list[14]	Individual[16]
Nicaragua	List	List	List	List	List[2]
Panama	Individual	Individual	Individual	List	Individual[2]
United States	Individual	Individual	Individual	Individual[17]	Individual[18]
AMERICA, SOUTH					
Argentina	List	List	List (birth)	List	([19])
Bolivia	List	Individual and list[20]	Individual	List	...
Brazil	Individual and list[21]	Individual and list[21]	Individual and list (birth)[21]	List	([19])
Chile	Individual and list[22]	Individual and list[22]	Individual and list[22]	Individual	([19])
Colombia	List	List[23]	Individual[24]	List	([19])
Ecuador	Individual	Individual	Individual	List	List
Paraguay	Individual and list	Individual and list	Individual and list	List	([19])
Peru	List	List	List (birth)[13]	List	([25])
Uruguay	...	Individual	Individual	...	...
Venezuela	Individual and list[26]	Individual[27]	Individual (death)	Individual	Individual[2]
ASIA					
Burma[28]	Individual	Individual	Individual (birth)	([29])	([30])
Ceylon	List	List	List	Lists and summary[31]	List[32]
India:[33]					
Madras (State)	Summary	Summary	Summary	([34])	([34])
Mysore (State)	List	List	List (birth)	([34])	([34])
Indonesia[35]	Individual	Individual	Individual	Individual	Individual
Iran	...	...	...	...	...
Israel	Individual	Individual	Individual (birth and death)	Individual	Individual
Japan	Individual	Individual	Individual	Individual	Individual
Jordan	Individual	Individual	([36])	List	List[2]
Lebanon	Summary	Summary	([36])	Summary	Summary
Pakistan:[37]					
Karachi (City)	List	List	List (birth)	([34])	([34])
Philippines	Individual	Individual	Individual (birth and death)	Individual	([19])
Syria	Summary	Summary	([36])	Summary	Summary
Thailand	Individual[38]	Individual[38]	Individual (birth and death)	Individual	Individual
Turkey	Individual[39]	Individual[39]	Individual (death)[40]	Individual[41]	Individual[2]

(Continued on following page)

Table 12. Type of Statistical Report Prepared by Civil Registrar and Used for Annual Compilation of National Statistics of Live Birth, Death, Stillbirth, Marriage, and Divorce: 65 Countries, as of 1 January 1950—*(Continued)*

Continent and country	*Live birth*	*Death*	*Stillbirth*	*Marriage*	*Divorce*
EUROPE					
Austria	Individual	Individual	Individual (birth)	Individual	Individual[2]
Belgium	Individual	Summary	Summary	Individual	Summary
Czechoslovakia	Individual	Individual	Individual (birth)	Individual	Individual[2]
Denmark	List	Individual	List and individual (birth)[42]	List	Individual[2]
Finland	List	Individual and list[43]	List (birth)	Individual	List[2]
France[44]	Individual	Individual	Individual	Individual	Individual
German Fed'l Republic[45]	Individual	Individual	Individual (birth)	Individual	Individual[2]
Greece	Individual	Individual	Individual (birth)	Individual	Individual
Iceland	Individual	Individual and list[46]	Individual (birth)	Individual	([3])
Ireland	Individual	Individual	([36])	Individual	([19])
Italy	Individual	Individual	Individual (birth)	Individual	([19])
Liechtenstein	Summary	Summary	Summary (birth)	Summary	...
Luxembourg	Individual	Individual	Individual	Individual	Individual
Monaco	...	...	...	...	...
Netherlands	Individual	Individual	Individual	Individual	List[2]
Norway	List	Individual and list[47]	Individual and list (birth)[48]	List	Individual[2]
Poland	List	List	List (birth)	List	Individual[2]
Portugal	Individual	Individual	Individual	Individual	Individual[2]
Spain[45]	Individual	Individual	Individual	Individual	([19])
Sweden	Individual	Individual	Individual (birth)	Individual	Individual
Switzerland	Individual	Individual	Individual[49]	Individual	Individual[2]
United Kingdom:					
England and Wales	Individual	Individual	Individual (birth)	Individual	Individual[2]
Northern Ireland	List	List	([36])	List	([3])
Scotland[50]	Individual and list	Individual and list	Individual and list	Individual	Summary[2]
Yugoslavia[51]	Individual	Individual	Individual (birth)	Individual	Summary[2]
OCEANIA					
Australia	List	List	([52])	List	Summary[53]
New Zealand	Individual	Individual	Individual (birth)[54]	Individual	Individual[2]

[1] There are two types of statistical reports from which live-birth and death statistics at national level may be compiled in Egypt—one a list of live births and stillbirths prepared by medical registrars in areas where health bureaux exist, and another list prepared by lay registrars in non-health-bureau areas, both transmitted to the Statistical Department, Ministry of Finance and Economy.

[2] Prepared from court records.

[3] Prepared by court registrar, but type of form unknown.

[4] National statistics of divorce are consolidations of subtotals prepared for provincial registration offices by chief registrars of divorce courts or by Clerk of Divorce Committee of Senate. A model (individual) national transcript is under study in one province.

[5] Individual statistical reports replaced the live-birth list on 1 January 1953, and the death list on 1 July 1951. With the new forms, a "stillbirth" or "foetal death" is reported on both the live-birth and the death certificate; but for compilation, the death report is used after matching the two reports and consolidating the information. Beginning 1953, the marriage report was replaced by two reports, an individual certificate of Catholic marriages prepared by priests, and by a *list* of civil marriages performed by civil registrars.

[6] In addition to the "list", which continues to be sent to the Dirección General de Estadística by the civil registrar, individual medical statistical reports of live birth (over 24 hours of age) and of death have, since 1952, been sent by the medical attendant or midwife to the Dirección General de Salubridad, and a tabular summary, prepared by civil registrars, is sent to the Oficina Nacional de los Censos Demográfico y Electoral.

[7] Lists of marriages registered in the Registro Civil and of divorces registered by the courts are sent to the Dirección General de Estadística and to the Oficina Nacional de los Censos Demográfico y Electoral, but current statistics are not compiled.

[8] Plans are being made to replace the lists by individual certificates. Beginning 1 July 1953, an experiment using individual certificates of death was initiated in 30 *municipios* in which health units exist.

[9] Civil registration of stillbirths is not compulsory, but such registration as does take place is made in the death register and reported statistically on both the live-birth and the death lists.

[10] In addition to the list of live births (and stillbirths) which is sent monthly by hospital authorities and the list of deaths prepared by civil registrars to the Direction générale de la santé publique, there is beginning 1952 a list completed by civil registrars for the Institut haïtien de statistique and, as a check on other data received, a list prepared by police officers for the Institut.

[11] The "birth" list is supplemented by a summary of causes of stillbirth by sex.

[12] Prior to 1952, statistics were not collected. Beginning 1952, a list report of events registered in the civil registry is being sent to the Institut haïtien de statistique.

[13] Civil registration of stillbirths is not compulsory, but such registration as does take place is made in live-birth register and reported for statistical purposes on the live-birth list.

(Continued on following page)

(*Footnotes to Table 12—Concluded*)

[14] Individual reports from cities of 25,000 or more population; lists from cities under 25,000 and rural. As of 1 January 1952, both of these were replaced by a revised list.

[15] Individual report for deaths occurring in the Distrito Federal and a list for remaining. As of 1 January 1952, both of these were replaced by a revised list. A medical certificate of cause is made separately.

[16] As of 1 January 1952, the individual form was replaced by a list.

[17] Individual marriage licences, issued by clerks of county or city courts, or transcripts of records of marriages performed are filed with state registrar of vital statistics in three fourths of the states. National statistics are estimates, based on state and local summaries.

[18] Certified copies or transcripts of court records are filed with the state registrar of vital statistics in approximately one half of the 48 states. National statistics are estimates, based on state summaries.

[19] Divorce, in the sense used here, does not exist.

[20] Individual death certificate, prepared by civil registrars and medical practitioner and sent to the Dirección General de Estadística and to the Dirección General de Sanidad, for deaths occurring in place where medical services are available (health units); lists, prepared by civil registrars, in all other areas.

[21] Individual report, completed by physicians for the Federal Service of Biostatistics in the National Health Department; list forms, prepared by civil registrars for Department of Demographic, Moral and Political Statistics.

[22] Individual forms to the Servicio Nacional de Estadística y Censos and lists to the Servicio Nacional de Salud, both prepared by civil registrars. Beginning 1 January 1954, one revised individual form replaced both of the above.

[23] In March 1951, a new (individual) form for the registration of death and the medical certification of cause was adopted incorporating the recommendations of the World Health Organization.

[24] Civil registration of stillbirths is not compulsory, but such registration as does take place is made in the death register and statistics are based on burial permits.

[25] Although divorces are registered in civil register, no statistical report is made either from the register or from court record.

[26] Individual forms, prepared by civil registrar and sent to the Dirección General de Estadística; for live births occurring in organized notification areas (*unidades sanitarias*), birth certificates prepared by medical attendant and list prepared by civil registrar for the use of the Ministerio de Sanidad y Asistencia Social.

[27] Individual statistical report, prepared by civil registrar and sent to the Dirección General de Estadística; medical certificate, prepared by civil registrar and medical practitioner and sent to the Ministerio de Sanidad y Asistencia Social.

[28] Statistics of live birth, death, and stillbirth for selected areas are obtained by consolidation of district and municipal summaries.

[29] Although registration of marriage is compulsory under same regulations as births and deaths, no registration form is prescribed and no statistical report is made.

[30] Registered only as part of records of court concerned, and no statistical report is made.

[31] List report among General and Muslim population; summary report for Kandyan population.

[32] General and Muslim divorces from court registrar; Kandyan-marriage divorces from civil registrar.

[33] Type of report prepared by local registrars varies from state to state; information available only for Madras and Mysore. Statistics of live birth, death, and stillbirth for a "registration area" are obtained by consolidation of state summaries.

[34] Civil registration of marriage and divorce is not compulsory for bulk of population; therefore, national statistics are not able to be compiled. See also notes to Tables 1 and 2.

[35] Civil registration is not compulsory for the bulk of the population; therefore, statistics are limited to the "European" segment, for which these forms are used.

[36] Civil registration of stillbirths is not compulsory, and statistics are not compiled from any other sources as they are under similar circumstances in Honduras, Colombia, and Peru.

[37] Type of report prepared by local registrars varies from province to province. Information available only for Karachi. Statistics of live birth, death, and stillbirth for a "registration area" are obtained by consolidation of provincial and municipal summaries.

[38] Although individual reports are available at national level, statistics are obtained by consolidation of provincial and municipal summaries. Medical certificate of death is separate.

[39] Quarterly summary by sex is reported to Ministry of Interior by Population Registrar, but not published. Individual forms are used for reporting of births and deaths in the villages of three provinces by the village teacher or by the *mukhtar* directly to the Central Statistical Office. Deaths in cities are reported on individual forms by the municipality or by the hospital on the basis of burial permits issued.

[40] Civil registration of stillbirths is not compulsory, but such as are registered are reported on death statistical report. Statistics are not compiled.

[41] Statistics are compiled for provincial and district centres only.

[42] Live-birth list sent to statistical office plus a medical certificate of stillbirth sent to the National Health Service by the physician.

[43] Individual certificates, prepared by civil registrar and the district medical officer or the attending physician; lists, prepared by parish and civil registrars—all transmitted to the Central Statistical Office.

[44] National statistics are obtained by consolidation of regional summaries, made by branch offices of the Institut national de la statistique et des études économiques.

[45] National statistics are obtained by consolidation of provincial summaries.

[46] Individual certificate of death, submitted by parish registrar quarterly; annual transcription (list) from register of deaths, revised by district physicians and accompanied by separate medical certificate and supplementary data in cases of accident.

[47] List sent by registrars to the Central Bureau of Statistics, plus individual medical certificate of death used for tabulating cause.

[48] Individual reports from medical attendant and birth list from civil registrars.

[49] Individual form for stillbirths, supplemented by individual live-birth statistical form.

[50] List report for live birth, death, and stillbirth is supplemented by an individual confidential statement of data not entered in register.

[51] National statistics of live birth, death, stillbirth, and marriage are obtained by consolidation of state summaries.

[52] Civil registration of stillbirths is not compulsory in States of Queensland or Tasmania (or in Victoria until 1953); therefore, national statistics are not able to be compiled.

[53] National statistics of divorce are consolidations of summaries prepared in each state from records kept by state supreme courts. The forms used in each state are the following:

New South Wales	individual
Western Australia	individual
South Australia	individual
Tasmania	individual
Queensland	list
Victoria	unknown

[54] Live-birth card plus medical certificate of cause of stillbirth.

Live-birth report. An analysis of the data in table 12 reveals that for live births, 31 or about half of the 65 countries have adopted an individual-type statistical report, while the list type is used by 19 countries. Chile, Costa Rica and El Salvador, which in 1950 used the list type, have since then adopted individual forms.

It is interesting to note in connexion with the type of form used that three countries have the registrar summarize the registrations and report them statistically not on a list or individual form, but as a statistical consolidation.

Death report. The distribution of types of statistical report used for deaths is essentially the same as for live births. Thirty-two of the 62 countries for which information is known use the individual type; 15 use the collective list report; four countries require a consolidation to be made at the local level and reported in a summary or tabular form.

Stillbirth report. For stillbirths, the same pattern is seen — 34 countries employ the individual form and 11 the list report. This situation is to be expected, not only because of the fact that countries tend to adopt a uniform type of report for all vital events, but also because stillbirths are reported on the same form used for live births and/or deaths in 30 countries.

Marriage report. The statistical report on marriages performed used in the 65 countries under discussion is the individual type in 32 and the list type in 20, with the summary report being used in several others.

Divorce report. Although the pattern is essentially the same as for marriage reporting, i.e., 24 countries employ an individual type compared with 12 which use a list, the completeness of the numbers in each group is limited by the fact that for 8 countries information is not available. The large frequency in the "unknown" category in the case of the divorce statistical report is due to the fact that, in 31 of the countries, statistical reports of divorce originate with the courts rather than with the civil registrar, and copies for study have not been available to the United Nations Statistical Office. It should also be recalled that, out of the 65 countries being studied, divorce is not recognized in nine, and in Burma, India, Pakistan, Peru, and Haiti no statistical reports are made on this event.

2. Characteristics

(a) *Uniformity*

The recommendation given in Principle 307 above makes a point of the desirability of uniformity as a characteristic of statistical reports. The intention of the Principle is that, throughout the country, the forms used for each event should be standard, that the instructions for their completion should also be standardized, and that the general format should be consistent from one report to another.

The principle of standardization of format is even more important in connexion with the statistical report than it is in relation to the legal register. In discussing the attribute of uniformity in connexion with the registration records, it was brought out that filing and indexing can be simplified if the registers are uniform. It would also be desirable that the registers for different events be uniform in size and shape. In so far as the form of the statistical report is concerned, not only does uniformity contribute to convenience of filing, but it is also an important factor in improving the efficiency of statistical processing.

National uniformity of format for reports on each event will be of assistance also in standardizing instructions to registrars. This aspect should not be overlooked in establishing a design for the statistical reports.

The principle of uniformity of design and intent is doubly important with respect to cause-of-death reporting. So important is this concept that it found expression as far back as 1925, when the League of Nations Health Committee made certain recommendations concerning a Standard Form of Certificate of the Cause of Death.[9] All of the arguments used by the Committee in recommending a standard form were focused on the problem from an international viewpoint, but they can readily be interpreted in a national context. For example, the Committee in its discussion said:

> "It is obvious that, if the questions put to medical practitioners in different countries differ materially, the answers received must also differ correspondingly and that the material for tabulation must therefore vary to some extent with the form of the certificate in use."

This concept is certainly just as applicable to national sub-divisions as it is to different countries.

The Committee further discussed the implication of the standard form on the selection of the cause to be coded when more than one is given by the certifier. A more detailed discussion of this point will be given in a later chapter, but it is of interest to note that it was this point of eliciting information which would "facilitate the selection of the underlying cause of death when two or more causes are jointly recorded" which led to a revision of the standard form in 1948. At that time, the International Conference for the Sixth Revision of the International Lists of Diseases and Causes of Death met in Paris. They approved the new "Classification"[10] prepared by the Expert Committee of the World Health Organization and recommended that a uniform Medical Certificate of Cause of Death be adopted. The adoption, by the First World Health Assembly in 1948, of the "Regulations No. 1"[11] embodying the recommendations of the Expert Committee and the Conference was to ensure their international acceptance. The specific Regulation which governs the use of the standard medical certificate is article 9 which states:

> "Each Member shall adopt a form of medical certificate of the cause of death that provides for the statement of:

[9] Report of the Group Entrusted with the Study of the Causes of Death. League of Nations. Health Committee. C.M. 1925. C.224. M.80. Appendix 3. p. 81-82.

[10] International Statistical Classification of Diseases, Injuries, and Causes of Death. Published in the Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death; 6th revision of the International Lists of Diseases and Causes of Death adopted 1948, vol. 1 (World Health Organization, *Bulletin*, Supplement 1), Geneva, 1948.

[11] World Health Organization Regulations No. 1 Regarding Nomenclature (Including the Compilation and Publication of Statistics) with Respect to Diseases and Causes of Death, adopted 24 July 1948 by the First World Health Assembly.

" I. the disease or condition directly leading to death, together with such antecedent morbid conditions as may exist, so that the underlying cause of death will be clearly indicated, and

"II. such other significant conditions contributing to the death but not related to the disease or condition causing death.

"The form of medical certificate of cause of death to be used shall conform as far as possible to the model given . . ."

It is in adherence to this Regulation that the Statistical Commission has included in the Principle 307 quoted on p. 104 the suggestion that the statistical report of cause of death should conform as far as possible to the international standard, a facsimile of which is given below:

International form of medical certificate of cause of death

CAUSE OF DEATH		Approximate interval between onset and death
I		
*Disease or condition directly leading to death**	(*a*) ..... due to (or as a consequence of)	.....
Antecedent causes. Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	(*b*) ..... due to (or as a consequence of)	.....
	(*c*)	.....
II		
Other significant conditions contributing to the death, but not related to the disease or condition causing it	.....	.....
	.....	.....

* This does not mean the mode of dying, e.g., heart failure, asthenia, etc. It means the disease, injury, or complication which caused death

The importance of considering the factors of size, shape and general layout and the necessity for obtaining uniformity in respect of these cannot be over-emphasized. The processing of any set of records tends to be simplified to the extent that each one is exactly equal in size and shape to every other one. Records which are similar can be arranged and filed more easily; they can be counted manually with more efficiency, and the editing and coding of information can be carried out more speedily and accurately. It is important, therefore, that national uniformity in size, shape, and layout of statistical reports be achieved if possible.

National practice. The basic uniformity of statistical reports among the five vital events upon which reports are required is revealed in the analysis of information in table 12. In that analysis, it was pointed out that the basic type pattern did not vary essentially from event to event, the distribution of countries by type of statistical report being the following:

Event	Total studied	Types of statistical report			
		Individual	List	Summary	Other
Live birth	61	31	19	3	8
Death	62	32	15	4	11
Stillbirth	57	34	11	2	10
Marriage	57	32	20	3	2
Divorce	43	24	12	6	1

Study of individual countries in table 12 will show that, with few exceptions, the same type of report adopted is used consistently for each type of event reported. The exceptions are due primarily to either of two factors, first the tendency to augment one type of report by another, for example, by a separate medical certificate of live birth, death, or stillbirth, and second, the differences occasioned in connexion with divorce statistical reports by the fact that their source is not always the registrar of births, deaths, and marriages but rather the court registrar or clerk.

(b) *Specificity of statistical reports*

Although it is not set forth explicitly in the international recommendation on the form of the statistical report, it is apparent that each type of statistical report should be designed for use with one type of vital event and one only. The reasons for this recommendation are similar to those discussed in chapter VII, where the advantages of separate registers for each type of event were set forth.

The possibilities of errors are greater in statistical reporting than they are in registering. This is so because of the fact that the latter procedure has legal implications and, accordingly, the correct completion of the registration record is likely to be subjected to more rigid standards of perfection. It follows, therefore, that the statistical reporting of a stillbirth on a form designed for live birth and/or death enhances the possibility of error. Not only is it possible that stillbirths will be reported incorrectly as live births or as deaths, but the

amount of data available will be limited to that required for the basic report of live birth or death, as the case may be.

National practice and effect of variation on statistics. Statistical reports of marriage are always distinctive, being designed for the purpose of reporting marriages alone. Likewise, in so far as can be ascertained from the samples of the statistical reports on file with the Statistical Office, the report form used for divorces is always specific. But a study of table 12 will show that the specificity does not extend to the report used for live births, deaths, and stillbirths.

Table 12 shows that a stillbirth statistical form designed for that purpose alone is reported by only 24 of the 57 countries for which information is available. Seventeen countries use the live-birth statistical report for both live births and stillbirths, while three report deaths and stillbirths on the same form. Six report stillbirths on both the form used for live births and on that used for deaths.

(c) *Completeness and accuracy*

The necessity for completeness and accuracy of statistical reports on vital events is the subject of United Nations Principle 305 (*b*),[12] which was quoted in connexion with the responsibilities of the registrar on p. 102. The pertinent recommendation is as follows:

> "(*b*) Whether the specified procedure provides that he transmit to the statistical authorities a duplicate of the original legal record or an independent statistical form . . ., this report should be as complete and accurate as he can make it and the coverage in terms of events occurred should also be complete and timely."

As will be noted from the Principle, the method used by the registrar in producing the statistical report will have a bearing on its potential accuracy. If the statistical report is prepared as a draft *before* any entry is made in the register and if it is read through and its reliability certified by the informant, then it will probably follow that either that draft itself or a copy of it will be the most accurate statistical report the registrar can produce. Moreover, if the copying of the draft, when required, is done by photographic methods rather than by transcription, the result will tend to be more accurate.

It may be concluded, therefore, that the basic responsibility of the registrar to produce an accurate and complete statistical report of each vital event can best be met by interrogation of the informant, recording of the information on the draft statistical report, subsequent review and verification of the recorded data by the informant, and — if reproduction of the draft is necessary — duplication of the report by the most accurate method available.

3. Good design

The appropriate and skilful design of the forms after their basic characteristics described above have been established deserves detailed consideration. It has been said that " 'appropriate design' means that in preparing the form it is carefully adapted to the various working processes through which it has to pass, while at the same time account is taken of the technical equipment of the printer in order to facilitate and thus cheapen the production of the form".[13]

The same author goes on to state that:

> "As a rule, lack of care in designing leads to faulty forms. Such forms can easily become the source of constant irritation and can cause unnecessary waste of time in filling in and handling. On the other hand, the appropriate form contributes to making the work proceed more smoothly, while at the same time economy is attained in its use both as regards working strain and working equipment."

In dealing with the problem of form design, there are certain general questions which need to be answered. The form designer needs to know (1) what working operations the form will be subjected to in filling it up and in subsequent handling, (2) what are the qualifications of the persons involved in its production and use, and (3) what is the length of life required of the form. With the answers to these questions in mind, the designer may turn to a consideration of the various components of a statistical report form. Size and shape, grade of paper, colour of paper, colour of printing, method of production, arrangement of text and lines, method of filling in, wording of guiding text and special directions — all these points must receive detailed consideration. Each of these components, as they relate to statistical reports on vital events, will be discussed below.

(a) *Size and shape of report*

It has been pointed out that the statistical report form for a vital event should provide adequate space for the response to each item of information required. It has also been noted that this is seldom possible with a list-type report. Whichever type report is chosen on the basis of other contributing factors, it is obvious that the amount of information desired will to some extent determine the over-all size and shape of the report. However, in determining that size, consideration should always be given to the standard sizes of paper easily obtainable, to the standard size of files in which the reports will need to be stored, and to the appropriateness of the size and shape for typewriter insertion. Because ease of handling, filing, or storing is a prime factor in the handling of a large volume of reports, it may be desirable to standardize the size and shape of the reports largely on such considerations, even though the area of the form may not be completely utilized.

No international standards of paper or file size and shape are available, but usage has developed national standards which should be adhered to in so far as possible. The reference cited above[14] gives the standard sizes of paper used in government work in Sweden. The standards used in the United States Government Printing Office may be found in *Principles of Design & Standardization of Forms Printed and Otherwise Repro-*

[12] *Principles for a Vital Statistics System, op. cit.* p. 10.

[13] *Appropriate Forms: A report on the technique of designing forms, and on the use and control of forms,* by B. Kronvall. International Institute of Administrative Sciences, Brussels, 1953. p. 7.

[14] *Ibid.* p. 15.

duced.[15] In the absence of other standards, the information in this reference may be useful.

(b) *Grade of paper*

In the section on records management in chapter VII, considerable attention was devoted to the problem of standardizing grades of paper for various purposes. It was pointed out in that connexion that the permanency of the registration record was the most important consideration in deciding on the grade of paper required. This factor is not so important for the statistical report. However, the composition of the paper in terms of durability, strength, nature of the surface as a recipient of ink, etc., the manner of handling, methods of reproduction, and the like should be considered. Standards applied in the United States are set forth in *The Repair and Preservation of Records*[16] cited in chapter VII.

A chart of the qualities of certain types of paper with an indication of the writing and erasing properties of each, the number of copies able to be made with pencil or typewriter, the permanency, durability, opacity, and approximate number of sheets per filing inch, will be found in *Principles of Design & Standardization of Forms Printed and Otherwise Reproduced.*[17] Information of this type should be considered before a decision is made on the grade of paper required for statistical reports.

(c) *Colour of paper*

The distinguishing of one type of report from another by the use of different colour of paper is desirable in most cases. Not only may it be of assistance in the sorting and handling of the reports, but it may have definite advantages from the point of view of alleviating eye strain.

Different colours may be assigned to reports which deal with different events or to reports for different destinations. Many examples of the use of colour to distinguish the statistical reports of different vital events may be given but, because of space limitations, only one or two will be mentioned here. Portugal, for example, uses the following colour scheme: live birth, white; death, tan; stillbirth, blue; marriage, white; divorce, magenta. The new forms introduced into the vital-statistics system of Chile in 1954 are white for live birth, blue for death, yellow for stillbirth, and green for marriage. Switzerland goes one step further, distinguishing not only the event but the sex by colour, viz., live birth (male), pink; live birth (female), green; death (male), white; death (female), yellow; stillbirth, orange; marriage, grey; and divorce, white.

The use of coloured paper to distinguish reports intended for different destinations has been adopted in the new forms used in Panama, where white reports of all events are destined for the Dirección General de Estadística y Censos, pink copies go to the local health unit, and green copies go to the hospital or attendant. Costa Rica has used this system also. A slight variation of this type appears in the new forms for Chile, where a large numeral printed on the variously coloured copies indicates the destination; for example, copies carrying a large numeral "1" are intended for the Servicio Nacional de Estadística y Censos, those with "2" for the local offices of the Servicio Nacional de Salud, and those labelled "3" for the Gabinete Central de Identificación. When such lettering is used for identification, the letters should be very large. Other symbols may also be used as a device for distinguishing one form from the other with or without colour.

(d) *Coloured printing ink*

"It has been found . . . that forms requiring much filling in can be dealt with much more quickly if the guiding text is printed in colour, as the entries filled in then stand out more clearly."[18]

Printing in coloured ink is not inexpensive, but this device has been put to good use in at least one vital statistics report form available for study. The certificate of death used in Uruguay is printed in black ink, while the stillbirth certificate, for which the reverse side of the death report is used, is printed in red. This is an example of the use of colour to distinguish two types of reports which otherwise might be hopelessly confused, inasmuch as they are printed on the same sheet of paper. The use of coloured ink on uniform colour paper stock might be considered as a method of distinction almost equivalent in efficiency to coloured paper stocks. The use of coloured ink for running text, while entries are typed or written in dark ink, also contributes markedly to the ease with which the information may be abstracted from the form.

(e) *Method of printing and reproduction*

The method of printing the original reports should be either letter-press printing or offset-lithographing. The relative advantages of these two methods cannot be treated in this *Handbook*. Suffice to say that the method chosen should provide reports which are aesthetically acceptable, as well as clear and easy to fill in and read.

The method of reproduction to be used in making copies of the original statistical report either for other agencies or for intermediate statistical processing must be carefully considered in deciding on a statistical form. If the copies are to be made in manifold by carbon paper at the time of initial preparation, then the paper used must be of such grade and opacity as to meet the requirements for producing the specified number of copies. If reproduction is to be by photostat or microfilm, other considerations of size, shape, and print type will be found important.

(f) *Layout of text and lines*

The manner in which items are arranged on the form is of importance not only for ease of insertion of the information but also for efficiency of interpretation and of classifying or coding. The first principle to be followed in this matter is the desirability of limiting the form to one side of the paper. The use of only one side of a form leaves the reverse side free for notations and explanations if required, but more important it

[15] *Principles of Design & Standardization of Forms Printed and Otherwise Reproduced.* War Production Board. Washington, Gov. Print. Off., 1943. 31 p.

[16] *The Repair and Preservation of Records,* by Adelaide E. Minogue. U.S. National Archives (Bulletin 5). September 1943. 56 p.

[17] *Principles of Design & Standardization . . . , op. cit.* p. 9-12.

[18] *Appropriate Forms . . . ,* op. cit. p. 17.

facilitates the insertion of the information and also the subsequent coding. The repeated turning of a form will increase the chances of omission in editing and coding and it will also tend to waste time.

The second principle to be followed in arranging the items on the form is to follow the natural order of the information, grouping related items together. The precise order of the items on the form should be established in relation to their source and also to their use. For example, if the statistical form is to be the source document for preparing an alphabetic index of names, then it would be desirable that the information to be entered in the index, specifically the various names and addresses, be near the top of the form. But it should not be overlooked that, if the statistical report is a duplicate of the register or is abstracted directly from it, the names may not be the first items. It will be clear that a careful balance must be achieved between these two requirements.

Another principle of good form design is that, in so far as possible, items should be placed in horizontal line positions rather than in columns. This facilitates insertion of data and provides more adequate space. The space for each item should be "boxed", that is, clearly delimited by rules. The length of each horizontal space will be determined by the size of the expected answer but, in so far as possible, consideration should be given to co-ordinating this requirement with the horizontal spacing of the standard typewriter so that the tabulator stop can be employed. The distance between horizontal lines should be determined by the space necessary for the answer and by the standard line spacing of a typewriter. It is also desirable to identify each item by a serial number running horizontally, line by line, to facilitate reference in instructions and to code boxes.

The use of check boxes or a striking out of inapplicable phrases, instead of space large enough to accommodate a complete response, is said to have some advantages in respect of space utilization but, in connexion with vital-statistics reports, it may have disadvantages for the following reasons. The registrar may inadvertently check the incorrect box, or he may arbitrarily choose one of the boxes in the absence of adequate information and, thus, pre-code the data. If a word is to be struck out, the registrar may interpret the instruction to mean to mark through the applicable answer rather than to eliminate the inappropriate one.

(g) *Wording of guiding text and special directions*

The necessity for using simple language on the form and accompanying the form by clear instructions is perhaps self-evident. It may be desirable in some cases to include on the report form the definition of at least some of the items so that there may be no question as to the meaning but, in any event, the registrar should be provided with complete instructions relating to the items on the form he is required to complete.

(h) *Items on the report*

The substantive details of content will depend on a number of factors which will be discussed in the following chapter. In addition to these substantive items, certain information of an identifying or administrative type is required on all well-designed forms. Statistical report forms for vital events, for example, should carry a title, an identifying serial number which is usually that by which the event may be located in the legal register, the name of the issuing or originating agency, the reporter (registrar), the destination of the report, and finally, specially assigned space for coding. These code boxes may follow the items to be coded or they may be segregated in the margin of the report, but spaces for writing the codes should always be provided. Provision of code boxes eliminates the need to write codes on the face of the form, where they may obscure the data, and also ensures that the code will always appear in the same relative position. Their provision in a uniform manner will help to increase efficiency of coding and of punching.

Table 13. Items of Statistical Information Included in Statistica

(Items are those of statistical interest on the report from which t
be obtainable from answers to other questions (for example, hosp
from absence of data on father) are not indicated unless specific
that the item named in the stub was included in the statistical r
indicates that the item was not included. Three dots

Line number	Statistical items	Africa	America, North											America, South										Asia			
		Egypt[1]	Canada[2]	Costa Rica[3]	Cuba[4]	Dominican Republic	El Salvador[5]	Guatemala	Haiti[6]	Honduras	Mexico[7]	Nicaragua	Panama[8]	United States[9]	Argentina	Bolivia	Brazil[10]	Chile[11]	Colombia[12]	Ecuador	Paraguay[13]	Peru	Uruguay[14]	Venezuela[15]	Burma[16]	Ceylon	India[17]	Indonesia[18]
	I. CHARACTERISTICS OF INFANT																										
1	Attendant at birth	X	X	—	—	X	X	X	—	X	—	—	X	X	—	—	—	X	—	X	X	—	...	—	—	—	—	—
2	Birth registration number	X	X	X	X	X	X	X	X	—	X	X	X	X	X	X	X	X	—	X	X	—	...	X	—	X	—	X
3	Citizenship (legal nationality)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	—	—	X	—
4	Date of baptism	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	...	—	—	—	—	—
5	Date of birth	X	X	X	X	X	X	X	X	—	X	X	X	X	X	X	X	X	X	X	X	X	...	X	—	—	—	X
6	Date of registration	X	X	X	X	X	X	X	—	X	X	X	X	X	X	X	X	X	—	X	—	X	...	X	X	X	X	X
7	Health condition	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X[27]	X	—	...	—	—	—	—	—
8	Hospitalization (see Place of birth, line 17)																											
9	Legitimacy	—	X	X	—	X	X	X	X	X	X	X	—	X	X	X	X	X	X	X	X	X	...	X	—	—	—	X
10	Legitimate or illegitimate	—	—	X	—	X	X	X	X	—	—	—	—	X	X	X	X	X	X	X	X	X	...	X	—	—	—	X
11	Are parents married to each other?	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	–	—	—	—	—	...	—	—	—	—	—
12	Marital status of mother and/or father	—	—	—	—	X	—	X	—	X	X	X	—	—	—	—	—	—	—	—	—	—	...	—	—	—	—	—
13	Length at birth	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	—	—	—	—
14	Name	—	X	—	—	X	X	X	—	—	—	—	X	X	—	X	X	X	X	X	X	—	...	X	—	—	—	—
15	Nationality (see Citizenship, line 3)																											
16	Period of gestation (months)	—	X[28]	—	—	—	X	—	—	—	—	—	—	X[28]	—	—	—	—	—	—	X	—	...	—	—	—	—	—
17	Place of birth (geographic)[29]	—	X	X	X	X	—	X	X	X	X	X	X	X	—	—	—	X	X	X	X	X	...	X	X	(30)	—	X
18	Hospital or institution	X	X	—	—	X	X	X	X	—	—	—	X	X	—	—	—	X	X	—	X	X	...	—	—	X	—	—
19	Place of registration[32]	X	X	X	X	X	X	X	—	—	X	X	—	X	X	X	X	X	X	—	X	X	...	X	X	X	X	X
20	Premature or full term	—	X	—	—	—	—	—	—	—	—	—	X[27]	—	—	—	—	X	—	—	—	—	...	—	—	—	—	—
21	Race or colour	—	—	—	(33)	X	—	—	—	—	—	—	—	—	—	X	—	—	—	X	—	—	...	—	X	X	—	—
22	Religion	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	X	—	X	—
23	Sex	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	...	X	X	X	X	X
24	Stillborn or liveborn	X	—	—	—	—	X	X	X	X[34]	—	—	X	—	X	—	—	—	—	—	—	X	...	—	—	—	—	—
25	Type of birth	X	X	—	—	X	X	X	X	X	X	X	X	X	X	—	X	X	—	X[27]	X	X	...	X	—	X	—	X
	If plural:																											
26	Order of this birth	—	—	—	—	—	—	X	—	—	—	—	X	X	—	—	—	—	—	X[27]	—	—	...	—	—	—	—	—
27	Other liveborn and stillborn	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	...	—	—	—	—	—
28	Registration number(s) of mate(s)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	—	—	—	—
29	Sex of mate(s)	X	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	X	...	—	—	—	—	—
30	Weight at birth	—	—	—	—	—	—	X	—	—	—	—	—	X	—	—	—	—	—	—	—	—	...	—	—	—	—	—
	II. CHARACTERISTICS OF MOTHER																											
31	Age (see Date of birth, line 34)																											
32	Birth registration number	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	—	—	—	—
33	Citizenship (legal nationality)	X	X	X	—	X	X	X	—	X	X	—	—	—	X	—	X	—	X	X	X	X	...	X	—	—	—	X
34	Date of birth or age (at time of birth)	X	X	X	—	X	X	X	—	X	X	X	X	X	X	X	—	X	X	X	X	X	...	X	—	X	X	X
35	Age	X	X	X	—	X	X	X	—	X	X	X	X	X	X	X	—	X	X	X	X	X	...	X	—	X	X	X
36	Date of birth	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	—	—	—	—
37	Date of marriage	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	—	—	—	—
38	Delivery, normal or otherwise	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	X[27]	—	—	...	—	—	—	—	—
39	Duration of hospitalization	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	—	—	—	—
40	Duration of marriage	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	—	—	—	—
41	Health condition	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	—	—	—	—
42	Industry	—	X	—	—	—	—	X	—	—	—	X	—	—	X	—	—	X	—	—	—	—	...	—	—	—	—	—
43	Language spoken and/or mother tongue	—	—	—	—	—	—	—	—	—	X	—	—	—	—	X	—	—	—	—	—	—	...	—	—	—	—	—
44	Literacy or level of formal education	—	—	—	—	—	X	—	—	X	X	—	—	—	—	X[37]	—	—	—	—	—	—	...	—	—	—	—	—
45	Name	—	X	—	—	—	X	X	—	—	—	—	X	X	—	X	—	—	X	X	X	—	...	—	—	—	—	—

Statistical Report of Live Birth: 61 Countries, as of 1 January 1950

om which national live-birth statistics are prepared. Those which may
mple, hospitalization from interpretation of addresses or "legitimacy"
ess specific instructions are available on that point. An "X" indicates
tatistical report for the country shown in the box-head. A dash "—"
hree dots ". . ." indicate that no information is available.)

Asia										*Europe*																							*Oceania*		
																												United Kingdom							
India[17]	*Indonesia*[18]	*Israel*	*Japan*	*Jordan*	*Lebanon*[19]	*Philippines*	*Syria*[19]	*Thailand*[20]	*Turkey*[21]	*Austria*	*Belgium*	*Czechoslovakia*	*Denmark*	*Finland*	*France*	*German Federal Republic*[19]	*Greece*	*Iceland*	*Ireland*	*Italy*[22]	*Liechtenstein*[19]	*Luxembourg*	*Netherlands*[8]	*Norway*	*Poland*	*Portugal*	*Spain*[19]	*Sweden*	*Switzerland*	*England and Wales*	*Northern Ireland*	*Scotland*[23]	*Yugoslavia*[19]	*Australia*[24]	*New Zealand*[25]	*Line number*
—	—	X	X	X	—	X	—	X	—	—	X	X	—	—	X	—	—	—	—	X	—	—	X	—	X	X	—	—	—	—	—	—	X	—	—	1
—	X	X	X	—	—	X	—	X	—	X	X	X	X	—	X	—	X	X	X	X	—	X	X	X	X	X	—	X	X	X	X	X	—	X	X	2
X	—	—	X	—	—	X	X	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	X	—	—	—	—	X	X	—	—	—	—	—	—	3
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4
—	X	X	X	X	—	X	—	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	5
X	X	X	X	X	X	X	X[26]	X	—	X	—	X	X	X	—	—	X	X	X	—	—	—	X	X	X	X	—	—	X	X	X	X	—	X	X	6
—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7
																																				8
—	X	X	X	—	—	X	X	—	—	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	9
—	X	—	X	—	—	X	X	—	—	X	X	—	X	X	X	X	X	X	X	X	X	X	X	—	X	X	X	X	—	X	X	X	X	X	X	10
—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	X	—	X	—	—	—	11
—	—	X	—	—	—	X	—	—	—	X	X	X	—	X	—	—	—	—	—	—	—	X	X	—	—	—	—	X	X	—	—	—	—	—	—	12
—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	13
—	—	X	X	X	—	X	—	X	X	X	X	X	—	X	X	—	X	X	X	X	—	X	—	X	X	—	—	X	—	X	X	—	—	—	—	14
																																				15
—	—	—	X	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	16
—	X	X	X	X	—	X	—	X	X	X	—	X	—	X	—	—	X	X	X	—	X	X	—	X	—	X	—	X[31]	X	X	X	X	X	X	X	17
—	—	X	X	—	—	—	—	—	—	X	X	X	—	—	X	—	X	—	—	X	—	X	X	X	—	X	—	—	X	—	—	X	X	X	X	18
X	X	X	X	—	X	X	X	X	—	X	X	X	X	X	X	X	X	X	X	X	—	—	X	X	X	X	X	X	X	X	X	X	—	X	X	19
—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21
X	—	—	—	—	X	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	X	—	X	—	—	—	—	—	X	—	—	—	—	—	—	22
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	23
—	—	X	—	—	—	X	—	X	—	X	—	X	X	X	—	—	X	X	—	X	X	—	—	X	X	—	—	X	X	X	—	—	X	X	X	24
—	X	X	X	—	—	X	—	X	X	X	—	X	X	X	X	X	X[35]	X	—	X[35]	—	X	X	X	X	X[35]	X	X	X	X	—	X	X	—	X	25
—	—	—	X	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	X	X	26
—	—	—	X	—	—	—	—	—	—	X	—	—	X	X	X	—	—	—	—	—	—	—	X	X	—	X	—	X	—	X	—	X	X	—	—	27
—	—	—	—	—	—	—	—	—	—	X	—	—	X	—	X	—	X	X	—	X	—	X	X	X	—	—	—	—	—	X	—	X	—	—	—	28
—	—	—	X	—	—	—	—	—	—	—	—	—	—	X	X	X	—	—	—	X	—	—	X	X	—	—	X	X	—	—	—	—	X	—	—	29
—	—	—	X	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	30
—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X		—	—	—	—	—	—	31
—	X	X	X	—	—	X	—	X	—	X[36]	X	—	—	—	X	—	—	—	—	—	X	X[36]	—	X	—	X	—	X	—	—	—	—	—	—	—	32
X	X	X	X	—	—	X	—	X	X	X	X	X	X	X	X	X	X	X	—	X	—	X	X	X	X	X	X	X	X	X	—	X	X	X	X	33
X	X	—	—	—	—	X	—	X	X	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	X	X	—	—	X	—	X	X	X	X	34
—	—	X	X	—	—	—	—	—	—	X	X	X	X	X	X	X	—	X	—	X	—	X	X	X	X	—	—	X	X	X	—	—	—	—	—	35
—	—	X	X	—	—	—	—	—	—	X	X	X	X	X	X	X	X	—	—	—	—	—	—	X	—	—	—	X	X	X	—	X	—	X	X	36
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	88
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	39
—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	X	—	X	40
—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	41
—	—	X	—	—	—	—	—	—	—	X	—	—	X[36]	—	X	—	X	—	—	—	—	X	X	X	—	—	—	—	X	—	—	—	—	—	—	42
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	43
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	44
—	—	X	X	X	—	X	—	X	—	—	—	—	—	X	X	—	—	X	X	X	—	—	—	X	—	—	—	X	—	X	X	—	—	—	—	45

(Table continued on next page)

Table 13. Items of Statistical Informatio

Line number	Statistical items	Africa	America, North											America, South							
		Egypt[1]	Canada[2]	Costa Rica[3]	Cuba[4]	Dominican Republic	El Salvador[5]	Guatemala	Haiti[6]	Honduras	Mexico[7]	Nicaragua	Panama[8]	United States[9]	Argentina	Bolivia	Brazil[10]	Chile[11]	Colombia[12]	Ecuador	Paraguay[13]
	II. CHARACTERISTICS OF MOTHER (continued)																				
46	Nationality (see Citizenship, line 33)																				
47	Number of children born	X	X	—	—	X	X	X	X	—	X	—	X	X	—	—	—	X	X	X	X
48	During her lifetime[39]	—	—	—	—	X	—	—	X	—	X	—	X	—	—	—	—	X	X	—	—
49	Liveborn	—	X	—	—	X	X	X	—	—	—	—	—	—	—	—	—	—	—	—	X
50	Born alive, still living	—	X	—	—	—	—	X	—	—	—	—	X	X	—	—	—	—	—	—	—
51	Born alive, now dead	—	—	—	—	—	X	—	—	—	—	—	—	X	—	—	—	—	—	—	X
52	Stillborn	—	X	—	—	X	X	X	—	—	—	—	—	X	—	—	—	—	—	X[27]	X
53	During present marriage[40]	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
54	Liveborn	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
55	Born alive, still living	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
56	Born alive, now dead	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
57	Stillborn	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
58	Occupation	X	X	—	X	X	X	X	—	X	X	X	X	—	X	X	—	X	X	X	X
59	Origin	X	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
60	Place of birth	—	X	—	X	—	—	X	—	—	X	X	X	X	—	—	—	X	—	X	—
61	Place of residence	X	X	—	—	X	X	X	X	—	—	—	X	X	—	—	—	X	(44)	—	X
62	Race or colour	—	—	—	—	X	—	X	—	—	—	—	X	X	—	X	—	—	—	X	—
63	Religion	X	—	—	—	—	—	—	—	—	X	X	—	—	—	—	—	—	—	—	—
64	Status (employer, employee, etc.)	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	X	—	—	—
	III. CHARACTERISTICS OF FATHER[45]																				
65	Age (see Date of birth, line 68)																				
66	Birth registration number	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
67	Citizenship (legal nationality)	X	X	X	—	X	X	X	—	X	X	—	—	—	X	—	X	—	X	X	X
68	Date of birth or age (at time of birth)	X	X	X	—	X	X	X	—	X	X	X	X	X	X	X	—	X	X	X	X
69	Age	X	X	X	—	X	X	X	—	X	X	X	X	X	X	X	—	X	X	X	X
70	Date of birth	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
71	Industry	—	X	—	—	—	—	X	—	—	—	X	X	X	X	—	—	X	—	—	—
72	Language spoken and/or mother tongue	—	—	—	—	—	—	—	—	—	X	—	—	—	—	X	—	—	—	—	—
73	Literacy or level of formal education	—	—	—	—	—	X	—	—	X	X	—	—	—	—	X[37]	—	—	—	—	—
74	Name	—	X	—	—	—	X	X	—	—	—	—	X	X	—	X	—	—	X	X	X
75	Nationality (see Citizenship, line 67)																				
76	Occupation	X	X	—	X	X	X	X	—	X	X	X	X	X	X	X	—	X	X	X	X
77	Origin	X	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
78	Place of birth	—	X	—	X	—	—	X	—	—	X	X	X	X	—	—	—	X	—	X	—
79	Place of residence	—	X	—	—	—	X	X	—	—	—	—	X	—	—	—	—	X	—	X	—
80	Race or colour	—	—	—	—	X	—	X	—	—	—	—	X	X	—	X	—	—	—	X	—
81	Religion	X	—	—	—	—	—	—	—	—	X	X	—	—	—	—	—	—	—	—	—
82	Status (employer, employee, etc.)	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	X	—	—	—

[1] Items shown below are those which appear on the health-bureau-area reports. Of these, only the following items are included in the non-health-bureau-area reports:
- birth registration number
- date of birth
- date of registration
- occupation of father or mother
- origin
- place of registration
- religion
- sex
- stillborn or liveborn

[2] Statistical report varies slightly among provinces. Items shown below are those which appear on the individual live-birth report used in British Columbia.

[3] Items shown below are those which appear on the "list" statistical report in use 1 January 1950. Beginning 1 January 1953, the list was replaced by an individual statistical report of birth (duplicate of registration record) and on 1 July 1953, a supplementary medical certificate of live birth was introduced. The regular individual report includes all the items below except "legitimacy", and in addition the following:
- attendant
- hospitalization
- liveborn or stillborn
- marital status of mother and father
- name of child
- name of mother and father
- number of children born (now dead; stillborn; abortions)
- occupation of mother and father
- period of gestation
- place of birth of mother and father
- place of usual residence of mother and father
- race (colour) of mother and father
- type of birth
  - if multiple, order of each mate

The separate *certificado médico de nacimiento*, prepared by medical attendant, includes in addition the following *medical* information:
- cause of death (if stillborn)
- complications of delivery
- date and place of certification
- did mother die? (from haemorrhage, infection?)
- how many consultations during pregnancy?
- illnesses during pregnancy
- length at birth
- operation?
- physical defects
- result of RH factor in mother
- results of seriological tests for syphilis
- weight at birth
- what substance used against ophthalmia?

Items shown below are those which appear on the list report sent to the Dirección General de Estadística, which was the report in use on 1 January 1950. The certificate used by the Dirección General de Salubridad beginning 1952, includes not only all these items (with the exception of "birth registration number" and "date of registration") but, in addition, the following as well:
- age (in years) of mother and father
- name of attendant
- name of infant
- name of grandparents
- name of mother and father
- number of children born to mother (born alive, still living; born alive, now dead; stillborn)
- occupation of grandparents
- place of birth of grandparents
- place of residence of grandparents
- place of residence of mother and father
- premature or full term
- type of birth (single or multiple)
- weight at birth

The tabular summary requires only total births registered in each *barrio* classified by "race" and "sex".

[5] Items shown below are those which appear on the list report in use 1 January 1950. The use of individual certificates (duplicates of registration record) to replace the list is under experimentation in selected areas.

[6] Items shown below are those which appear on the list report sent by hospitals to the Direction générale de la santé publique, in use 1 January 1950. The two lists which since 1952 go to the Institut haïtien de statistique include only the following items:
- date of birth of infant
- date of registration
- marital status of parents
- name of infant
- name of mother and father
- place of birth of infant
- place of registration
- place of residence of mother and father
- sex

[7] Items shown below are those which appear on the individual live-birth report in use 1 January 1950 for places of 25,000 or more population. Of these, only the following are included in the list report for places of under 25,000:
- birth registration number
- date of birth
- date of registration
- place of registration
- sex
- type of birth

The revised form (list), which replaced both the above as of 1 January 1952, includes the following items:
- age of mother and father
- age of registrant
- birth order (all births)
- birth registration number
- date of birth
- date of registration
- marital status of mother and father
- place of birth
- place of registration
- sex
- type of birth

[8] Items shown below are those which appear on the individual transcript of the live-birth registration used in 1950 by the Departamento de Salud Pública. A revised transcript, which was introduced by the Dirección de Estadística y Censo beginning 1953, contains the following items:
- age of mother and father
- birth registration number
- date of birth
- date of mother's marriage
- date of registration
- identity of attendant (signature, address, date)
- income of parents
- legitimacy
- name of child
- name of mother and father
- number of children born to this mother (born alive, now living; born alive, now dead; stillborn)
- period of gestation (months)
- place of birth
  - hospital or institution
- place of registration
- place of residence of mother
- *reconocido(a)* (yes or no?)
- sex
- type of birth
  - if multiple, order of this birth
- weight at birth

[9] National statistics of live birth are based on microfilm images of the original certificates for some states and on transcripts of birth registrations for others. Items shown below are those contained in the Standard Certificate of Live Birth (1949 revision), to which the certificates of most states conform closely.

[10] Items shown below are those which appear on the list report sent by civil registrars to the Department of Demographic, Moral and Political Statistics.

[11] Items shown below are those which appear on the individual report sent by the civil registrars to the Servicio Nacional de Estadística y Censos. The list form collected by the Servicio Nacional de Salud includes only the following items:
- age of mother
- birth registration number
- date of birth of child
- date of registration
- identity of attendant
- legitimate or illegitimate?
- place of registration
- place of residence of mother
- sex
- total issue of mother, including this birth

The revised statistical report (individual), which in March 1954 replaced both the above, includes the following items to be completed by the civil registrar:
- age of mother and father
- attendant at birth
- birth registration number
- citizenship of mother and father

Table 13. Items of Statistical Information Included in Statistical Report of Live Birth: 61 Countries, as of 1 January 1950—*(Continued)*

North						*America, South*										*Asia*															
Haiti[6]	*Honduras*	*Mexico*[7]	*Nicaragua*	*Panama*[8]	*United States*[9]	*Argentina*	*Bolivia*	*Brazil*[10]	*Chile*[11]	*Colombia*[12]	*Ecuador*	*Paraguay*[13]	*Peru*	*Uruguay*[14]	*Venezuela*[15]	*Burma*[16]	*Ceylon*	*India*[17]	*Indonesia*[18]	*Israel*	*Japan*	*Jordan*	*Lebanon*[19]	*Philippines*	*Syria*[19]	*Thailand*[20]	*Turkey*[21]	*Austria*	*Belgium*	*Czechoslovakia*	*Denmark*
X	—	X	—	X	X	—	—	—	X	X	X	X	—	...	—	—	—	X	X	X	X	—	—	X	—	X	—	X	X[38]	X[38]	X
X	—	X	—	X	—	—	—	—	X	X	—	—	—	...	—	—	—	—	X	X	X	—	—	X	—	X	—	—	—	X	X
—	—	—	—	—	—	—	—	—	—	—	—	X	—	...	—	—	—	X	—	—	X	—	—	—	—	—	—	—	—	—	—
—	—	—	—	X	X	—	—	—	—	—	—	—	—	...	—	—	—	—	—	X	X	—	—	X	—	—	—	—	—	—	—
—	—	—	—	—	X	—	—	—	—	—	—	X	—	...	—	—	—	—	—	X	X	—	—	—	—	X	—	—	—	X	—
—	—	—	—	—	X	—	—	—	—	—	X[27]	X	—	...	—	—	—	—	—	X	X	—	—	—	—	X	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	—	—	—	—	X[41]	—	—	—	—	—	—	—	X[42]	—	X	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	—	—	—	—	X[41]	—	—	—	—	—	—	—	—	X	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	—	—	—	—	X[41]	—	—	—	—	—	—	—	—	X	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	—	—	—	—	X[41]	—	—	—	—	—	—	—	—	—	—	—
—	X	X	X	X	—	X	X	—	X	X	X	X	X	...	—	—	—	—	X	X	X	—	—	X	—	X	—	X	X	X	X[36]
—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	—	—	—	X	X	—	—	—	—	—	—	—	—	—	X[43]	—
—	—	X	X	X	X	—	—	—	X	—	X	—	—	...	X	—	—	—	X	X	X	—	—	X	—	X	—	—	X	—	—
X	—	—	—	X	X	—	—	—	X	(44)	—	X	—	...	—	—	X	—	X	X	X	X	—	X	—	X	—	X	X	X	X
—	—	—	—	X	X	—	X	—	—	—	X	—	X	...	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—
—	—	X	X	—	—	—	—	—	—	—	—	—	—	...	X	—	—	—	—	X	—	—	—	X	—	—	—	X	—	X	—
—	—	—	X	—	—	—	—	—	X	—	—	—	X	...	—	—	—	—	—	—	—	—	—	—	—	—	—	X	X	X	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—
—	X	X	—	—	—	X	—	X	—	X	X	X	X	...	X	—	—	—	—	X	X	X	—	X	—	X	—	X	X	—	—
—	X	X	X	X	X	X	X	—	X	X	X	X	X	...	X	—	—	—	X	X	X	—	—	X	—	X	X	—	X	X	X
—	X	X	X	X	X	X	X	—	X	X	X	X	X	...	X	—	—	—	X	—	—	—	—	X	—	X	X	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	—	—	—	—	X	X	—	—	—	—	—	—	—	X	X	X
—	—	—	X	X	X	X	—	—	X	—	—	—	—	...	—	—	—	—	—	X	—	—	—	—	—	—	—	X	—	—	X
—	—	X	—	—	—	—	X	—	—	—	—	—	—	...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	X	X	—	—	—	—	X[37]	—	—	—	—	—	—	...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	X	X	—	X	—	—	X	X	X	—	...	—	—	—	—	—	X	—	X	—	X	—	X	—	—	—	—	—
—	X	X	X	X	X	X	X	—	X	X	X	X	X	...	—	—	—	—	X	X	X	—	—	X	—	X	—	X	X	X	X
—	—	—	—	—	—	—	—	—	—	—	—	—	—	...	—	—	—	—	X	X	—	—	—	—	—	—	—	—	—	X[43]	—
—	—	X	X	X	X	—	—	—	X	—	X	—	—	...	X	—	—	—	—	X	X	—	—	X	—	X	—	—	X	—	—
—	—	—	—	X	—	—	—	—	X	—	X	—	—	...	—	—	—	—	X	X	—	X	—	X	—	—	—	—	—	X	—
—	—	—	—	X	X	—	X	—	—	—	X	—	X	...	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—
—	—	X	X	—	—	—	—	—	—	—	—	—	—	...	X	—	—	—	—	X	—	X	—	X	—	—	—	X	—	X	—
—	—	—	X	—	—	—	—	—	X	—	—	—	X	...	—	—	—	—	—	—	—	—	—	—	—	—	—	X	X	X	—

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sex
type of birth

[8] Items shown below are those which appear on the individual transcript of the live-birth registration used in 1950 by the Departamento de Salud Pública. A revised transcript, which was introduced by the Dirección de Estadística y Censo beginning 1953, contains the following items:

age of mother and father
birth registration number
date of birth
date of mother's marriage
date of registration
identity of attendant (signature, address, date)
income of parents
legitimacy
name of child
name of mother and father
number of children born to this mother (born alive, now living; born alive, now dead; stillborn)
period of gestation (months)
place of birth
  hospital or institution
place of registration
place of residence of mother
reconocido(a) (yes or no?)
sex
type of birth
  if multiple, order of this birth
weight at birth

[9] National statistics of live birth are based on microfilm images of the original certificates for some states and on transcripts of birth registrations for others. Items shown below are those contained in the Standard Certificate of Live Birth (1949 revision), to which the certificates of most states conform closely.

[10] Items shown below are those which appear on the list report sent by civil registrars to the Department of Demographic, Moral and Political Statistics.

[11] Items shown below are those which appear on the individual report sent by the civil registrars to the Servicio Nacional de Estadística y Censos. The list form collected by the Servicio Nacional de Salud includes only the following items:

age of mother
birth registration number
date of birth of child
date of registration
identity of attendant
legitimate or illegitimate?
place of registration
place of residence of mother
sex
total issue of mother, including this birth

The revised statistical report (individual), which in March 1954 replaced both the above, includes the following items to be completed by the civil registrar:

age of mother and father
attendant at birth
birth registration number
citizenship of mother and father

date of birth
date of registration
legitimacy
name of child
name of mother
occupation of mother and father
place of birth (hospital, home, other)
place of birth of mother and father
place of registration
place of residence of mother
sex
status of mother and father
number of children born to this mother, including this birth (born alive, still living; born alive, now dead; stillborn)
type of birth

[12] Items shown below are those which appear on the report of baptisms prepared from parish registers and from which statistics of live birth are compiled. Beginning in 1952, the same form is being used to report statistically births registered by civil authorities.

[13] Items shown below are those which appear on the individual report used by the División de Bioestadística of the Ministerio de Salud Pública. The list report used by the Dirección General del Registro Civil (for Asunción) and the Dirección General de Estadística y Censos includes only:

birth registration number
citizenship of parents
date of registration
hour of birth
legitimacy
number of children born
occupation of parents
place of registration
sex
type of birth

[14] A project is under way to utilize an individual medical certificate of live birth for compilation of live-birth statistics in the Ministerio de Salud Pública.

[15] Items shown below are those which appear on the individual report sent by civil registrars to the Dirección General de Estadística. The medical certificate of attended births sent to the Ministerio de Sanidad y Asistencia Social includes the following items:

age of mother and father
date of birth
date of marriage of mother and father
date of report
legitimacy *(reconocido(a))*
name of child
name of mother and father
number of children born alive to this mother, including this one (born alive, still living)
period of gestation (months)
place of birth
  hospital
place of birth of mother and father
place of residence of mother and father
sex

stillborn
type of birth
  if multiple, order of this birth

The statistical list from the civil registrars to
terio de Sanidad y Asistencia Social includes the

age of mother and father
birth registration number
date of birth
date of registration
legitimacy *(reconocido(a))*
name of attendant
name of child
name of mother and father
place of birth
  hospital
place of birth of mother and father
place of registration
place of residence of mother
sex

An *Experimento sobre un sistema de estadísti*
is being conducted by the Dirección General de E
y Censos Nacionales, in collaboration with the
de Sanidad y Asistencia Social and other intere
cies, to determine the best form for a system of v
tics which would be in accordance with modern
ments and international recommendations. New
statistical transcripts of live birth, death, foe
marriage, and divorce have been developed. The
the live-birth transcript are as follows:

age of mother and father
attendant at birth
citizenship of mother and father
date of beginning of mother's last menstru
date of birth
date of registration
industry of mother and father
legitimate, illegitimate, *reconocido(a)*
marital status of mother and father
name of child
name of mother and father
number of children born alive to this mothe
  ing this one (born alive, still living)
occupation of mother and father
place of birth
  hospital, institution, etc.
place of registration
place of residence of mother
sex
stillborn
type of birth (single, multiple, etc.)
  if multiple, order of this birth
weight at birth

[16] Items shown below are those which appear in
lar summary forms which serve as specifications
tralized compilation of birth statistics in each vill
police circle, or town. Consideration is being gi
placing the summaries by an individual statisti
of birth and to centralizing compilation. The i
gested for collection are the following:

age (at next birthday) of mother and father
birth registration number

Syria[19]	Thailand[28]	Turkey[21]	Europe: Austria	Belgium	Czechoslovakia	Denmark	Finland	France	German Federal Republic[19]	Greece	Iceland	Ireland	Italy[22]	Liechtenstein[19]	Luxembourg	Netherlands	Norway	Poland	Portugal	Spain[19]	Sweden	Switzerland	United Kingdom: England and Wales	United Kingdom: Northern Ireland	United Kingdom: Scotland[23]	Yugoslavia[19]	Oceania: Australia[24]	Oceania: New Zealand[25]	Line number
																													46
—	X	—	X	X[38]	X[38]	X	X	X	X	X[38]	X	—	X	—	X	X	X	X	X	—	X	X	X	—	X	X	X	X	47
—	X	—	—	—	X	X	X	X	—	—	X	—	—	—	—	X	—	X	X	—	—	—	—	—	—	X	—	—	48
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	49
—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	50
—	X	—	—	—	X	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	51
—	X	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	52
—	—	—	X[42]	—	X	—	X[42]	X[41]	X[42]	—	—	—	X	—	X[42]	X	X[41]	—	X	—	X[42]	—	X[41]	—	X[41]	—	X	X	53
—	—	—	—	—	—	—	—	—	—	X[41]	—	—	—	—	—	—	—	—	—	—	—	X[42]	—	—	—	—	—	—	54
—	—	—	—	X	—	—	—	X[41]	—	—	—	—	—	—	X[42]	—	X[41]	—	—	—	—	X[42]	X[41]	—	X[41]	—	—	X	55
—	—	—	—	X	—	—	—	X[41]	—	—	—	—	—	—	—	—	—	—	—	—	—	X[42]	—	—	—	—	—	X	56
—	—	—	—	—	—	—	—	X[41]	—	X[41]	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	57
—	X	—	X	X	X	X[36]	X	X	—	X	X	—	—	—	X	X	X	—	X	—	—	X	—	X[36]	X	—	—	—	58
—	—	—	—	—	X[43]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	59
—	X	—	—	X	—	—	—	X	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	X	X	60
—	X	—	X	X	X	X	—	X	X	X	X	—	—	X	X	X	X	X	X	—	—	X	—	X[36]	X	—	X	X	61
—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	62
—	—	—	X	—	X	—	—	—	—	X	—	—	—	X	X	X	X	—	—	—	—	X	—	—	—	—	—	—	63
—	—	—	X	X	X	—	—	X	—	—	—	—	—	—	X	X	—	X	—	—	—	X	—	—	—	X	—	—	64
																													65
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	66
—	X	—	X	X	—	—	—	X	—	—	—	—	—	X	X	—	X	—	X	—	X	—	—	—	—	—	—	—	67
—	X	X	—	X	X	X	X	X	—	X	X	—	—	—	X	X	X	X	X	X	X	—	—	—	—	—	X	X	68
—	X	X	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	X	X	—	—	—	—	—	—	X	X	69
—	—	—	—	X	X	X	X	X	—	—	X	—	—	—	X	X	X	X	—	—	X	—	—	—	—	—	—	—	70
—	—	—	X	—	—	X	—	X	—	X	—	—	—	—	X	X	X	—	—	—	—	X	—	—	—	—	—	—	71
—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	72
—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	73
—	X	—	—	—	—	—	X	X	—	—	X	X	X	—	—	—	X	—	—	—	X	—	X	X	—	—	—	—	74
																													75
—	X	—	X	X	X	X	X	X	X	X	X	X	X	—	X	X	X	—	X	—	X	X	X	X	X	—	X	X	76
—	—	—	—	—	X[43]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	77
—	X	—	—	X	—	—	—	X	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	X	X	78
—	—	—	—	—	X	—	—	—	—	—	X	X	—	X	—	X	X	X	—	—	X	X	—	X	X	—	—	X	79
—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	80
—	—	—	X	—	X	—	—	—	—	X	—	—	—	X	X	X	X	—	—	—	—	X	—	—	—	—	—	—	81
—	—	—	X	X	X	—	—	X	—	—	—	—	X	—	X	X	—	X	—	—	—	X	—	—	—	X	—	—	82

stillborn
type of birth
if multiple, order of this birth

The statistical list from the civil registrars to the Ministerio de Sanidad y Asistencia Social includes the following:

age of mother and father
birth registration number
date of birth
date of registration
legitimacy *(reconocido(a))*
name of attendant
name of child
name of mother and father
place of birth
hospital
place of birth of mother and father
place of registration
place of residence of mother
sex

An *Experimento sobre un sistema de estadísticas vitales* is being conducted by the Dirección General de Estadística y Censos Nacionales, in collaboration with the Ministerio de Sanidad y Asistencia Social and other interested agencies, to determine the best form for a system of vital statistics which would be in accordance with modern requirements and international recommendations. New individual statistical transcripts of live birth, death, foetal death, marriage, and divorce have been developed. The items on the live-birth transcript are as follows:

age of mother and father
attendant at birth
citizenship of mother and father
date of beginning of mother's last menstruation
date of birth
date of registration
industry of mother and father
legitimate, illegitimate, *reconocido(a)*
marital status of mother and father
name of child
name of mother and father
number of children born alive to this mother, including this one (born alive, still living)
occupation of mother and father
place of birth
hospital, institution, etc.
place of registration
place of residence of mother
sex
stillborn
type of birth (single, multiple, etc.)
if multiple, order of this birth
weight at birth

[16] Items shown below are those which appear in the tabular summary forms which serve as specifications for decentralized compilation of birth statistics in each village tract, police circle, or town. Consideration is being given to replacing the summaries by an individual statistical report of birth and to centralizing compilation. The items suggested for collection are the following:

age (at next birthday) of mother and father
birth registration number
citizenship of mother and father
date of birth
date of marriage
date of registration
name and address of informant
name and identity of attendant
name of child
name of mother and father
occupation of mother and father
period of gestation (months)
place of birth
place of registration
place of residence of mother
race of mother and father
religion of mother and father
sex
status of father
stillborn
total number of children born alive to this mother, including this one (born alive, still living)
type of birth

[17] It is not yet possible to compile national vital statistics, although consolidations are made at the national level of such state tabulations as are available (see Table 1, note 16). State tabulations are, in turn, tabular summaries of district compilations. Items shown below are those which appear in the tabular summary required of the various districts in the State of Madras.

[18] Items shown below are those which appear on the individual report of births among European population, for whom registration is compulsory. An experiment in voluntary registration is at present under way in the regency Banjumas in middle Java, and the items appearing on the three-part form used are as follows:

birth registration number
citizenship
date of birth
date of registration
name of child
name of mother and father
place of birth
hospital
place of registration
place of residence of mother
sex
type of birth

[19] Items shown below are those which appear in the tabular summary forms which serve as specifications for decentralized compilation of birth statistics at a subnational geographic level. National statistics are consolidations of these tabulations. For Spain, items below refer only to infants who have survived at least 24 hours.

[20] Items shown below are those *available* at the national level on individual reports. Statistics are not compiled from these reports, however, but by consolidation of monthly tabular summaries which include for each registration locality births by age-group of mother, sex, and birth order.

[21] Items shown below are those which appear on the individual birth statistical forms used in the villages of three provinces in an experiment designed by the Central Statistical Office to collect birth statistics from reports of the *mukhtars*.

[22] This individual form was revised in 1952 with the addition of "age of mother" and "details of recognition" (for recognized illegitimates).

[23] Items shown below are a combination of those which appear on the list return of births registered and on the confidential statement.

[24] Statistical report varies slightly among states. Items shown below are those which appear on a nationally standardized statistical transcript list of live births registered in each state.

[25] In addition to the items shown below, "period of gestation" and "weight at birth" were to be collected, beginning 1952.

[26] Distinguishing only those registered in month of occurrence from those delayed.

[27] For medically attended births only.

[28] In weeks. For Canada, only if premature.

[29] See also "Place of birth registration"; where births are registered in place of occurrence, either item should give "Place of birth (geographic)".

[30] Only whether same as place of residence of mother or not.

[31] Place where mother church-registered irrespective of actual place of birth.

[32] See also "Place of birth (geographic)"; where births are registered in place of occurrence, either item should give "Place of birth registration".

[33] Item on report but data not collected since 1940 constitutional reform.

[34] Also whether died within 24 hours of birth.

[35] Also previous plural births to this mother.

[36] Only if birth illegitimate.

[37] Level of education.

[38] Also, date of last previous birth, if any.

[39] In the Dominican Republic, Haiti, Mexico, the USA, Ecuador, Israel, Denmark, France, Netherlands and Portugal, questions relate to "previous issue" or "previous pregnancies", i.e., excluding this birth. In Colombia, India (Madras), Indonesia, Czechoslovakia, Finland, Iceland, Poland, and Yugoslavia, question is in terms of "birth order" and is assumed to *include* this birth, as it is in all remaining countries where reference is not clear.

[40] In Egypt, Israel, Belgium, France, Netherlands, Norway, Portugal, England and Wales, Scotland, Australia, and New Zealand, questions relate to "previous issue", i.e., excluding this birth. In Austria, Czechoslovakia, Finland, German Federal Republic, Italy, Luxembourg, and Sweden, question is in terms of "birth order" and is assumed to *include* this birth, as it is in all remaining countries where reference is not clear.

[41] Also births during previous marriages, but separately.

[42] Including legitimized.

[43] Ethnic group.

[44] "Urban" or "rural" only.

[45] Limited, in most cases, to reports of "legitimate births".

Table 14. Items of Statistic

(Items are those of sta
be obtainable from an
indicated unless specifi
included in the statistic

Line number	Statistical items	Africa	America, North											America, South						
		Egypt[1]	Canada[2]	Costa Rica[3]	Cuba[4]	Dominican Republic	El Salvador[5]	Guatemala	Haiti[6]	Honduras	Mexico[7]	Nicaragua	Panama[8]	United States[9]	Argentina	Bolivia[10]	Brazil[11]	Chile[12]	Colombia[13]	Ecuador	Paraguay[14]
	I. CHARACTERISTICS OF EVENT																				
1	Cause of death[32]	X	X	X	—	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Deaths due to external violence:																				
2	Accident, suicide, or homicide?	X	X	—	—	X	—	X	—	—	—	—	X	X	—	X	—	—	—	X	X
3	Date of injury	—	X	—	—	—	—	—	—	—	—	—	X	X	—	—	—	—	—	X	—
4	Manner of injury	X	X	—	—	X	—	—	—	—	—	—	X	X	—	X	—	—	X	—	X
5	Nature of injury	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6	Place of injury (industry, home, public place, etc.)	—	X	—	—	—	—	X	—	—	—	—	X[34]	X[34]	—	—	—	—	—	X[35]	—
7	Was this an occupational injury?	—	—	—	—	—	—	—	—	—	—	—	X	X	—	—	—	—	—	—	—
	Certification of cause:																				
8	Autopsy	—	X	—	—	—	—	X	—	—	—	—	X	X	—	—	—	—	—	X	—
9	Certifier	—	X	—	—	X	—	X	—	—	X	X	X	X	—	X	—	X	X	X	X
10	Operation	—	X	—	—	—	—	X	—	—	—	—	X	X	—	X	—	—	—	X	X
11	Date of death	X	X	X	X	X	X	X	—	—	X	X	X	X	X	X	X	X	X	X	X
12	Date of death registration	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—
13	Death registration number	X	X	X	X	X	X	X	—	—	X	X	X	X	X	X	X	X	—	X	X
14	Medical attendance during last illness[39]	—	X	X	—	X	X	X	X	X	—	—	X	X	X	X	—	—	X	X	X
15	Place of death (geographic)[40]	—	X	—	X	X	—	X	—	X	X	X	X	X	—	X	—	X	X	X	X
16	Hospital or institution	X	X	X	—	X	—	X	—	—	—	—	X	X	—	X	X	X	—	X	X
17	Place of death registration[42]	X	X	X	X	X	X	X	X	—	X	X	X	X	X	X	X	X	—	X	X
	II. CHARACTERISTICS OF DECEDENT																				
18	Age at death (see Date of birth, line 24)																				
19	Age at marriage	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20	Age or date of birth of surviving spouse	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—
21	Birth order[41]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22	Birth registration number	—	—	—	—	—	—	—	—	—	(46)	—	—	X	(46)	X	—	—	—	—	—
23	Citizenship (legal nationality)	—	X	—	X	X	X	X	—	X	X	—	X	X	X	X	X	—	X	X	X
24	Date of birth or age	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
25	Age	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26	Date of birth	—	X	—	—	—	—	—	—	—	—	—	X	X	X	—	—	X	—	X	—
27	Date of marriage	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—
28	Diet of infant[44]	—	—	—	—	—	—	—	—	X	X	X	—	—	—	—	—	X	—	—	—
29	Duration of marriage	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30	Duration of stay in place of death	X	X	—	—	—	—	—	—	—	—	—	X	X	—	X	—	—	—	X	—
31	Hospitalization (see Place of death, line 15)																				
32	Identification number	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	X	—	—
33	Industry	—	X	—	—	—	—	X	—	—	X	X	X	X	X	X	—	X	—	—	—
34	Language	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—
35	Legitimacy[50]	—	—	X	—	—	X	—	—	—	—	—	—	—	X	X	—	X	X	X	X
36	Literacy or level of formal education	—	—	—	—	—	X	—	—	X	X	X	—	—	—	—	—	—	—	—	—
37	Marital status	X	X	X	X	X	X	X	—	X	X	X	X	X	X	X	X	X	X	X	X
38	Name	—	X	X	—	X	X	X	—	—	X	—	X	X	X	X	X	X	X	X	X
39	Nationality (see Citizenship, line 23)																				
40	Number of children born	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	X	—
41	Occupation	X	X	—	X	X	X	X	—	X	X	X	X	X	X	X	X	X	X	X	X
42	Origin	X	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
43	Place of birth	—	X[54]	—	—	—	—	—	—	—	X	X	X	X	—	X	—	X	X	X	—

[1] Items shown below are those which appear on the health-bureau-area reports. Of these, only the following items are included in the non-health-bureau-area reports:

age
date of death
date of registration
death registration number
marital status
occupation
origin
place of registration
religion
sex

[2] Statistical report varies slightly among provinces. Items shown below are those which appear on the individual death report used in British Columbia.

[3] Items shown below are those which appear on the "list" statistical report. Beginning 1 July 1951, the list was replaced by an individual statistical report of death (duplicate of registration record) which includes the medical certification. Items included on this certificate of death are as follows:

age
date of birth
date of death
industry
legitimacy, yes or no?
length of stay in place of death
length of stay in place of usual residence
marital status
name of deceased
nationality (naturalized or not?)
period of gestation (for stillborn or infant deaths)
occupation
place of birth
place of death (hospital or institution)
place of registration
place of usual residence
race or colour
sex
Social security, yes or no?
status
stillborn (yes or no?)
in absence of medical certification:
cause of death
duration of illness
nature of external violence:
agent or instrument causing death
occupational injury?
place of accident
medical certification of cause of death (1948):
autopsy?
date of operation (findings of)
in case of death due to external violence:
agent or instrument
occupational injury?
place of accident
probable cause of death (when medical certifier was not medical attendant of deceased)

[4] Items shown below are those which appear on the list report sent to the Dirección General de Estadística, which was the report in use on 1 January 1950. Items appearing on the individual certificate destined for the Health Department are as follows:

age
citizenship (legal nationality)
date of birth
length of stay in place of death
length of stay in place of usual residence
marital status
name of deceased
name of father and mother
name of spouse
occupation
place of birth
place of birth of father and mother
place of death (hospital or institution)
place of usual residence
place where fatal illness contracted
race
sex
time of death
medical certificate, which contains the following items:
autopsy findings
cause of death (1938)
direct or immediate
indirect, underlying or principal
other pathological conditions
International List number
certifier (name, signature, address)
date deceased last seen alive
duration of attendance of deceased
duration of fatal illness
duration of indirect, underlying, or principal cause of death
operational findings
place and date of certification
place of burial
place where illness contracted
undertaker (name, address)

The tabular summary requires only total deaths registered in each *barrio* classified by sex and race.

[5] Items shown below are those which appear on the lis report in use 1 January 1950. Beginning 1 July 1953, a individual certificate of death replaced the list in 30 *municipios* in which there are health units. If the experiment i successful, its use will be extended to the whole country The items included in the new certificate are the following

age
accident, suicide, or homicide?
date and hour of occurrence
manner of injury
occupational injury
place where accident occurred
autopsy (yes or no)
findings
certifier (name, title, signature)
citizenship (legal nationality)
date of death
date of operation
findings
death registration number
industry
International Form 1948
length of stay in place of death
marital status
name of deceased
name of father and mother
name of spouse
occupation
period of gestation (for ages under one year)
place of death (hospital or institution)
place of residence during last six months
sex

[6] Items shown below are those which appear on the lis report, sent by civil registrars to the Direction général de la santé publique, in use 1 January 1950. The two list which since 1952 go to the Institut haïtien de statistiqu include the following items:

age
date of registration
marital status
name of deceased
place of registration
place of residence
sex

[7] Items shown below are those which appear on the indi vidual report of death in use 1 January 1950 in the Dis trito Federal. Items appearing on the list report used fo the rest of the country are as follows:

age
cause of death (principal)
certifier (name, address)
citizenship (legal nationality)

Table 14. Items of Statistical Information Included in Statistical Report of Death: 61 Countries, as of 1 January 1950

(Items are those of statistical interest on the report from which national death statistics are prepared. Those which may be obtainable from answers to other questions (for example, hospitalization from interpretation of addresses) are not indicated unless specific instructions are available on that point. An "X" indicates that the item named in the stub was included in the statistical report for the country shown in the box-head. A dash "—" indicates that the item was not included.)

	America, South										Asia																					
	Argentina	Bolivia[10]	Brazil[11]	Chile[12]	Colombia[13]	Ecuador	Paraguay[14]	Peru	Uruguay	Venezuela[15]	Burma[16]	Ceylon	India[17]	Indonesia[18]	Israel	Japan	Jordan	Lebanon[19]	Philippines	Syria[19]	Thailand[20]	Turkey[21]	Austria	Belgium[22]	Czechoslovakia	Denmark[23]	Finland[24]	France	German Federal Republic[19]	Greece	Iceland[25]	Ireland
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	(33)	X	—	X	X	X	X	X	X	X	X	X	X	X	X
	—	X	—	—	—	X	X	—	X	—	—	—	—	—	—	X	—	—	X	—	—	—	X	X	X	—	X	—	—	X	X	X
	—	—	—	—	—	X	—	—	X	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	—	X	—	—	X	—	X	—	X	X	—	—	—	—	—	X	—	—	X	—	—	—	X	X	—	—	—	—	—	X	X	X
34	—	—	—	—	—	X[35]	—	X	—	—	—	—	—	—	—	X[31]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X[36]	—
	—	—	—	—	—	—	—	X	—	X	—	—	—	—	—	X	—	—	—	—	—	—	X	—	X	—	—	—	—	—	X[36]	—
	—	—	—	—	—	X	—	—	X	—	—	—	—	—	X	X	—	—	X	—	—	—	—	—	—	—	—	—	—	—	X[36]	—
	—	X	—	X	X	X	X	—	X	X	—	—	—	X	X	X	—	—	X	—	X	—	X	—	—	X	(37)	X	—	X	X	X
	—	X	—	—	—	X	X	—	X	X	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	X	X	X	X	X	X	X	X	X	X	—	—	—	X	X	X	X	—	X	—	X	X	X	X	X	X	X	X	X	X	X	X
	X	X	X	X	X	X	—	X	—	—	X	X	X	X	X	X	—	X	X	X[38]	X	—	X	X	X	X	X	—	X	X	X	X
	X	X	X	X	—	X	X	X	X	X	X	X	—	X	X	X	—	—	X	—	X	—	X	—	X	—	X	X	—	X	X	X
	X	X	—	—	X	X	X	X	—	X	—	—	—	—	X	—	—	—	X	—	—	—	—	—	—	X	X	—	—	X	X	X
	—	X	—	X	X	X	X	X	X	X	X	(41)	—	X	X	X	X	—	X	—	X	X	X	—	X	X	X	—	—	X	X	X
	—	X	X	X	—	X	X	—	X	X	—	X	—	X	X	X	—	—	—	—	—	X	X	—	X	X	—	X	—	X	—	—
	X	X	X	X	—	X	X	X	X	X	X	X	X	X	X	X	—	X	X	X	X	—	X	X	X	X	—	X	—	X	X	X
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—
	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—
	(16)	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X[45]	—	—	—	—	—
	X	X	X	—	X	X	X	X	—	X	—	—	X	—	X	X	X	—	X	X	X	X	X	—	—	—	—	X	—	—	—	—
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—	—	X	—	X	X	X	X	(48)	X	X	—	—	—	X	X	X	X
	X	—	—	X	—	X	—	—	X	X	—	—	—	X[11]	X	X	—	—	—	—	X	—	X	X	X	X	X	X	X	X	X	—
	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	X	—	—	—	—
	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	X	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	—	X	—	—	—	X	—	—	—	X	—	—	—	—	—	—	—	—	X	—	X	—	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	X	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—
	X	X	—	X	—	—	—	—	X	—	—	—	—	—	X	X	—	—	—	—	—	—	X	—	—	X	X	X	—	X	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	X	X	—	X	X	X	X	X	—	X	—	—	—	—	—	X	—	—	—	—	—	—	X	—	—	X	X	X	—	X	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	X	X	X	X	X	X	X	X	X	X	—	—	—	—	—	X	—	—	X	—	X	—	X	X	—	—	—	—	—	—	—	—
	X	X	X	X	X	X	X	—	X	X	—	—	—	—	—	X	X	X	X	—	X	X	X	X	X	X	X	X	X	X	X	X
	—	X	—	—	—	X	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	X	—	X	—	—
	X	X	X	X	X	X	X	X	X	X	—	—	—	X	X	X	X	—	X	—	X	X	X	X	X	X	X	X	—	X	X	X
	—	—	—	—	—	—	—	—	—	—	—	—	—	X	X	—	—	—	—	—	—	—	—	—	X[53]	—	—	—	—	—	—	—
	—	X	—	X	X	X	—	—	X[11]	X	—	—	—	X	X[51]	X	—	—	X[54]	—	X	—	—	—	X	X	—	X	—	X	X	—

shown below are those which appear on the list
use 1 January 1950. Beginning 1 July 1953, an
al certificate of death replaced the list in 30 *muni-*
which there are health units. If the experiment is
il, its use will be extended to the whole country.
is included in the new certificate are the following:

dent, suicide, or homicide?
ite and hour of occurrence
anner of injury
cupational injury
ace where accident occurred
psy (yes or no)
ndings
ifier (name, title, signature)
enship (legal nationality)
of death
of operation
ndings
h registration number
istry
rnational Form 1948
th of stay in place of death
ital status
e of deceased
e of father and mother
e of spouse
pation
od of gestation (for ages under one year)
e of death (hospital or institution)
e of residence during last six months

shown below are those which appear on the list
ent by civil registrars to the Direction générale
té publique, in use 1 January 1950. The two lists
nce 1952 go to the Institut haïtien de statistique
he following items:

of registration
ital status
e of deceased
e of registration
e of residence

shown below are those which appear on the indi-
port of death in use 1 January 1950 in the Dis-
leral. Items appearing on the list report used for
of the country are as follows:

e of death (principal)
ifier (name, address)
enship (legal nationality)
date of death
date of registration
death registration number
diet (if under one year of age)
industry
marital status
occupation
place of registration
place of residence
sex
was deceased resident of place of death?
was death certified by physician?

The separate medical certificate of death completed by authorized physicians contains the following items:

age
cause of death (principal and intervening)
citizenship (legal nationality)
date of death
diet (if under one year of age)
marital status
name of deceased
name of father and mother (living?)
name of spouse (living?)
occupation
place of birth
place of death (hospital, etc.)
place of residence
sex
was deceased resident of place of death? (if not, where?)

The revised form (list) which replaced both the list and individual forms as of 1 January 1952 includes the following items:

age
cause of death (principal) (from medical certificate or other?)
date of death
date of registration
death registration number
place of death
place of registration
sex
was deceased resident of place of death?
was death medically certified?

[9] Items shown below are those which appear on the transcript of the certificate of death used in 1950 by the Departamento de Salud Pública. A revised transcript which was introduced by the Dirección de Estadística y Censo beginning 1953 contains the following items:
age
autopsy?
cause of death (1948 International Form)
date of birth
date of death
date of registration
death registration number
duration of medical attendance (dates)
in case of death from external violence:
was it accident, suicide, or homicide?
date of injury
manner of injury
occupational injury?
place of injury (street, home)
industry
informant (name, relationship to deceased)
length of stay in place of death
medical certifier (name, address)
name of deceased
occupation
operation? (findings)
place of birth
place of death (hospital)
place of registration
place of residence
probable cause of death determined by physician (though not in attendance)
probable cause of death determined by registrar
symptoms on which diagnosis based
sex

[10] National statistics of death are based on microfilm images of the original certificates for some states and on transcripts of death registration for others. Items shown below are those contained in the Standard Certificate of Death (1949 revision), to which the certificates of most states conform closely.

[11] Items shown below are those which appear on individual health-unit-area reports prepared jointly by civil registrar and medical practitioner and sent to the Dirección General de Estadística and the Dirección General de Sanidad. Items included on the list form for non-health-bureau areas are as follows:
age
cause of death
date of death of spouse
date of registration
death registration number
legitimacy
marital status
name of deceased
name of father and mother
name of spouse
occupation
place of regist
race
sex

[11] Items shown b
report sent by civi
graphic, Moral an
the individual forr
Biostatistics are a
age
cause of deatl
cemetery (nai
findings of au
findings of op
if deceased fo
length of stay
marital status
medical certifi
name of decea
name of fathe
occupation of
occupation of
place of birth
place of birth
place of deatl
place of resid
race or colour
sex

[12] Items shown b
dividual report se
Nacional de Esta
by the Servicio N
lowing items:
age
cause of deat
date of regist
death registra
for deaths un
age of moth
legitimacy
total issue
place of regis
place of resid
sex
type of certif

The revised st
March 1954 replac
items to be compl
age
cause of deat
certifier (ider
citizenship
date of death

ountries, as of 1 January 1950

prepared. Those which may
tion of addresses) are not
em named in the stub was
the item was not included.)

Syria[10]	Thailand[20]	Turkey[21]	Europe: Austria	Belgium[22]	Czechoslovakia	Denmark[23]	Finland[24]	France	German Federal Republic[19]	Greece	Iceland[25]	Ireland	Italy[26]	Liechtenstein[19]	Luxembourg	Netherlands[27]	Norway[28]	Poland	Portugal	Spain[19]	Sweden[29]	Switzerland	United Kingdom: England and Wales	United Kingdom: Northern Ireland	United Kingdom: Scotland[30]	Yugoslavia[19]	Oceania: Australia[31]	Oceania: New Zealand	Line number
—	X	X	X	X	X	X	X	X	X	X	X	X	X	—	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1
—	—	—	X	X	X	—	X	—	—	X	X	X	X	—	X	X	—	—	—	—	—	X	—	—	X	X	—	—	2
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3
—	—	—	X	X	—	—	—	—	—	X	X	X	X	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	4
—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	5
—	—	—	—	—	—	—	—	—	—	—	X[36]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6
—	—	—	X	—	X	—	—	—	—	—	X[36]	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7
—	—	—	—	—	—	—	—	—	—	—	X[36]	—	X	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	8
—	X	—	X	—	—	X	(37)	X	—	X	X	X	X	—	X	X	—	—	X	—	—	X	X	X	X	X	X	X	9
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	10
—	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	—	X	—	X	11
X[38]	X	—	X	X	X	X	X	—	X	X	X	X	—	—	—	—	X	X	X	—	—	X	X	X	X	—	X	X	12
—	X	—	X	—	X	—	X	X	—	X	X	X	X	—	X	X	X	X	X	—	—	X	X	X	X	—	X	X	13
—	—	—	—	—	—	X	X	—	—	X	X	X	X	—	X	X	—	—	X	—	—	X	X	X	—	X	—	—	14
—	X	X	X	—	X	X	X	—	—	X	X	X	—	X	X	X	X	—	X	—	—	X	X	X	X	X	X	X	15
—	—	X	X	—	X	X	—	X	—	X	—	—	X	—	—	—	X	—	X	X	—	X	—	—	X	—	X	—	16
X	X	—	X	X	X	X	—	X	X	X	X	X	X	—	—	X	X	X	X	X	X	X	X	X	X	—	X	X	17
																													18
—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	19
—	—	—	—	—	—	—	—	X	—	—	—	—	X	—	X	X	—	—	X	—	X	X[43]	X	—	X	—	—	—	20
—	—	—	—	—	—	X	—	X[45]	—	—	—	—	X	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	21
—	—	—	—	—	—	—	—	—	—	—	—	—	X[47]	—	—	X	—	—	—	—	X	—	—	—	—	—	—	—	22
X	X	X	X	—	—	—	—	X	—	—	—	—	—	X	X	X	X	—	X	—	—	X	—	—	—	—	—	—	23
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	24
X	X	X	(48)	X	X	—	—	—	X	X	X	X	X	X	—	—	—	—	X	X	—	—	X	X	X	X	X	X	25
—	X	—	X	X	X	X	X	X	X	X	X	—	X	—	X	X	X	X	—	—	X	X	—	—	—	—	—	—	26
—	—	—	X	—	—	—	—	X	—	—	—	—	—	—	X	X	—	—	—	—	X	X	X[49]	—	X	—	—	—	27
—	—	—	—	—	—	—	—	X	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	28
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	X[49]	—	X	—	X	—	29
—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	30
																													31
—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	32
—	—	—	X	—	—	X	X	X	—	X	—	—	—	—	X	X	X	—	—	X	—	X	—	—	—	—	—	—	33
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	34
—	—	—	X	X	X	X	X	X	X	X	X	—	X	—	X	—	X	X	X	X	—	X	—	—	X	X	X	—	35
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	36
—	X	X	X	X[51]	X	X	X	X[52]	X	X	X	X	X	X	X	X[52]	X	X	X	X	X[52]	X[52]	X	X	X	X	X	X	37
—	X	X	X	—	X	X	X	—	—	X	X	X	X	—	X	X	X	X	—	—	X	—	X	X	—	—	—	X	38
																													39
—	—	—	—	—	—	—	—	X	—	X	—	—	—	—	X	—	—	—	X	—	—	X	X[49]	—	X[49]	—	X	—	40
—	X	X	X	X	X	X	X	X	—	X	X	X	X	—	X	X	X	—	X	—	X	X	X	X	X	—	X	X	41
—	—	—	—	—	X[53]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	42
54 —	X	—	—	—	X	X	—	X	—	X	X	—	X	—	X	X	X[44]	—	X	—	X	—	—	—	—	—	X[54]	X[54]	43

age
autopsy?
cause of death (1948 International Form)
date of birth
date of death
date of registration
death registration number
duration of medical attendance (dates)
in case of death from external violence:
  was it accident, suicide, or homicide?
  date of injury
  manner of injury
  occupational injury?
  place of injury (street, home)
industry
informant (name, relationship to deceased)
length of stay in place of death
medical certifier (name, address)
name of deceased
occupation
operation? (findings)
place of birth
place of death (hospital)
place of registration
place of residence
probable cause of death determined by physician (though not in attendance)
probable cause of death determined by registrar
  symptoms on which diagnosis based
sex

[9] National statistics of death are based on microfilm images of the original certificates for some states and on transcripts of death registration for others. Items shown below are those contained in the Standard Certificate of Death (1949 revision), to which the certificates of most states conform closely.

[10] Items shown below are those which appear on individual health-unit-area reports prepared jointly by civil registrar and medical practitioner and sent to the Dirección General de Estadística and the Dirección General de Sanidad. Items included on the list form for non-health-bureau areas are as follows:

age
cause of death
date of death of spouse
date of registration
death registration number
legitimacy
marital status
name of deceased
name of father and mother
name of spouse
occupation
place of registration
race
sex

[11] Items shown below are those which appear on the list report sent by civil registrars to the Department of Demographic, Moral and Political Statistics. Items included on the individual form used in 1953 by the Federal Service of Biostatistics are as follows:

age
cause of death (1948 International Form)
cemetery (name)
findings of autopsy
findings of operation
if deceased foreign born, length of stay in Brazil
length of stay in place of death
marital status
medical certifier (signature, address)
name of deceased
name of father and mother
occupation of deceased
occupation of father and mother
place of birth of deceased
place of birth of father and mother
place of death (hospital, etc.)
place of residence
race or colour
sex

[12] Items shown below are those which appear on the individual report sent by the civil registrars to the Servicio Nacional de Estadística y Censos. The list form collected by the Servicio Nacional de Salud includes only the following items:

age
cause of death (immediate, underlying, and related)
date of registration
death registration number
for deaths under one year:
  age of mother
  legitimacy
  total issue of mother, including this one
place of registration
place of residence
sex
type of certification

The revised statistical report (individual), which in March 1954 replaced both the above, includes the following items to be completed by the civil registrar:

age
cause of death (1948 International Form)
certifier (identity)
citizenship
date of death
date of registration
death registration number
for deaths due to external violence:
  circumstances
  occupational injury?
  place of injury (street, etc.)
for deaths under two years:
  birth registration number
  date of birth
  date of birth registration
  legitimacy
  name of mother
  place of birth
how was diagnosis confirmed?
identification number *(cédula)*
marital status
name
occupation
place of birth
place of identification registration
place of registration
place of residence
sex
status

[13] Items shown below are those which appear on the list of burial permits prepared by the local registrars. In March 1951, a new (individual) form for the registration of death and the medical certification of cause was adopted incorporating the recommendations of the World Health Organization.

[14] Items shown below are those which appear on the individual report used by the División de Bioestadística of the Ministerio de Salud Pública. The list report used by the Dirección General del Registro Civil and the Dirección General de Estadística y Censos includes only the following:

age
cause of death
citizenship
date of death
date of registration
death registration number
hour of death
legitimacy (for infants)
live birth or stillbirth?
marital status
medical certification
occupation
place of registration
sex

[15] Items shown below are those which appear on the individual certificate prepared jointly by civil registrars

(Table continued on next page)

Table 14. Items of Statistical Informati

Line number	Statistical items	Africa	America, North											America, South							
		Egypt[1]	Canada[2]	Costa Rica[3]	Cuba[4]	Dominican Republic	El Salvador[5]	Guatemala	Haiti[6]	Honduras	Mexico[7]	Nicaragua	Panama[8]	United States[9]	Argentina	Bolivia[10]	Brazil[11]	Chile[12]	Colombia[13]	Ecuador	Paraguay[14]
	II. CHARACTERISTICS OF DECEDENT (continued)																				
44	Place of birth registration	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—
45	Place of marriage	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
46	Place of marriage registration	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—
47	Place of residence	X	X	X	—	X	X	X	—	X	X	—	X	X	—	X	—	X	(55)	X	X
48	Premature or full term[44]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
49	Race or colour	—	—	X	X[57]	X	—	X	—	—	—	—	X	X	—	X	—	—	—	X	—
50	Religion	X	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
51	Sex	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
52	Social security number	—	—	—	—	—	—	—	—	—	—	—	X	X	—	—	—	—	—	—	—
53	Status (employer, employee, etc.)	—	—	—	—	—	—	—	—	—	X	X	—	—	—	—	—	X	—	—	—
54	Stillbirth or death	—	—	X	—	—	X[58]	X	—	—	—	—	—	—	—	—	—	—	—	—	—
55	Weight and length at birth[44]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	III. CHARACTERISTICS OF MOTHER AND/OR FATHER																				
56	Age at death of deceased[59]	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	X	—	X	—
57	Alive at death of deceased?	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—
58	Citizenship (legal nationality)	—	—	—	—	—	—	—	—	—	—	—	—	—	X[60]	—	—	—	—	—	—
59	Date of birth of mother[44]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
60	Industry[61]	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	X	—	—	—
61	Name	—	X	—	—	—	—	X	—	—	—	—	X	X	—	X	—	X[44]	—	X	—
62	Nationality (see Citizenship, line 58)																				
63	Occupation[62]	X	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	X	—	—	—
64	Place of birth	—	X	—	—	—	—	—	—	—	—	—	X	—	X[60]	—	—	X[44]	—	—	—
65	Race or colour	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
66	Status (employer, employee, etc.)[44]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—

and medical attendants for use in the Ministerio de Sanidad y Asistencia Social. The individual report prepared by registrars for the Dirección General de Estadística includes only the following items:

age
citizenship
date of birth
date of death
death registration number
legitimacy
length of stay in place of death
marital status
name
occupation
place of death
place of registration
sex

An *Experimento sobre un sistema de estadísticas vitales* is being conducted; see Table 13, note 15, for details. Items appearing on the experimental statistical transcript of death are as follows:

age
burial permit number
cemetery (name)
citizenship
date of birth
date of death
date of registration
for deaths under one year:
  birth registration number
  legitimacy
  period of gestation (months)
  place of birth
  place of birth registration
  type of birth
  weight at birth
industry
length of stay in place of death
length of stay in place of residence
marital status
medical assistance?
name
occupation
place of death (also "urban" or "rural")
  hospital
place of registration
place of residence
sex
Social Security membership?
status
if death is medically certified, a *separate* medical certificate includes:
autopsy? (findings)
cause of death (1948 International Form)
certifier (name, signature, address, teelphone number, duration of attendance)
deaths due to external violence:
  manner of injury
  nature of occurrence
  occupational injury?
  place of occurrence
name of deceased
operation? (findings)
place of registration
probable cause of death (based on information from informant)
in absence of medical certification, registrar secures the following information:
deaths due to external violence:
  manner of occurrence
  nature of occurrence
  occupational injury?
  place of occurrence
duration of fatal illness
probable cause of death (based on information from informant)

[10] Items shown below are those which appear in the tabular summary forms which serve as specifications for decentralized compilation of death statistics in each village tract, police circle, or town. Consideration is being given to replacing the summaries by an individual statistical report of death and to centralizing compilation. Items suggested for collection are the following:

age
attendant at last illness (name, identity)
cause of death (direct, morbid conditions giving rise to direct cause, and underlying)
citizenship
date of death
date of registration
death registration number
informant (name, address)
marital status
name of deceased
name of father and mother
occupation
place of death
place of registration
place of residence
race
religion
sex
status

[17] It is not yet possible to compile national vital statistics, although consolidations are made at the national level of such state tabulations as are available (see Table 1 note 16). State tabulations are, in turn, tabular summaries of district compilations. Items shown below are those which appear in the tabular summary required of the various districts in the State of Madras.

[18] Items shown below are those which appear on the individual report of deaths (excluding those dying before registration of birth) among European population, for whom registration is compulsory. For the items on the statistical report of death of infants born alive who die before registration of birth, see Table 15. An experiment in voluntary registration is at present under way in the regency Banjumas in middle Java, and the items appearing on the three-part form used are as follows:

birth registration number
citizenship
date of birth
date of death
date of registration
death registration number
name of deceased
name of father and mother
place of birth
place of death (hospital)
place of registration
place of residence of deceased
place of residence of father and mother
sex

[19] Items shown below are those which appear in the tabular summary forms which serve as specifications for decentralized compilation of death statistics at subnational geographic levels. National statistics are consolidations of these tabulations. For Spain, items below refer only to persons who die after 24 hours of life.

[20] Items shown below are those *available* at the national level on individual reports. Statistics are not compiled from these reports, however, but by consolidation of monthly tabular summaries which include for each registration locality, deaths by cause, age group, and sex. Ages under one year are given in detail.

[21] Items shown below are those which appear on the individual report for deaths in cities used by the Central Statistical Office. A less complex form prepared by *mukhtars* in villages has the following items:

age
cause of death
date of death
marital status
name
place of death
sex

Table 14. Items of Statistical Information Included in Statistical Report of Death: 61 Countries, as of 1 January 1950—*(Continued)*

North America						America, South										Asia												Europe			
Haiti[6]	Honduras	Mexico[7]	Nicaragua	Panama[8]	United States[9]	Argentina	Bolivia[10]	Brazil[11]	Chile[12]	Colombia[13]	Ecuador	Paraguay[14]	Peru	Uruguay	Venezuela[15]	Burma[16]	Ceylon	India[17]	Indonesia[18]	Israel	Japan	Jordan	Lebanon[19]	Philippines	Syria[19]	Thailand[20]	Turkey[21]	Austria	Belgium[22]	Czechoslovakia	Denmark[23]
—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	X	X	—	X	X	—	X	—	X	(55)	X	X	—	X	X	—	X	—	X	X	X[56]	X	—	X	—	X	X[56]	X	—	X	X[56]
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—
—	—	—	—	X	X	—	X	—	—	—	X	—	X	X	—	X	X	—	—	—	—	—	—	—	—	X	—	—	—	X	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	X	—	X	—	X	X	—	—	X	X	X	—	X	—
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
—	—	—	—	X	X	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	X	X	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	X	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	X	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—
—	—	—	—	—	—	X	—	—	X	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	X[60]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	X	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	X	X	—	X	—	X[44]	—	X	—	—	—	—	—	—	—	—	X	—	—	—	—	—	X	—	—	—	—	X[44]
—	—	—	—	—	—	X	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	X	X
—	—	—	—	X	—	X[60]	—	—	X[44]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—
—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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s specifications for
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t the national level

of such state tabulations as are available (see Table 1, note 16). State tabulations are, in turn, tabular summaries of district compilations. Items shown below are those which appear in the tabular summary required of the various districts in the State of Madras.

[16] Items shown below are those which appear on the individual report of deaths (excluding those dying before registration of birth) among European population, for whom registration is compulsory. For the items on the statistical report of death of infants born alive who die before registration of birth, see Table 15. An experiment in voluntary registration is at present under way in the regency Banjumas in middle Java, and the items appearing on the three-part form used are as follows:

birth registration number
citizenship
date of birth
date of death
date of registration
death registration number
name of deceased
name of father and mother
place of birth
place of death (hospital)
place of registration
place of residence of deceased
place of residence of father and mother
sex

[19] Items shown below are those which appear in the tabular summary forms which serve as specifications for decentralized compilation of death statistics at subnational geographic levels. National statistics are consolidations of these tabulations. For Spain, items below refer only to persons who die after 24 hours of life.

[20] Items shown below are those *available* at the national level on individual reports. Statistics are not compiled from these reports, however, but by consolidation of monthly tabular summaries which include for each registration locality, deaths by cause, age group, and sex. Ages under one year are given in detail.

[21] Items shown below are those which appear on the individual report for deaths in cities used by the Central Statistical Office. A less complex form prepared by *mukhtars* in villages has the following items:

age
cause of death
date of death
marital status
name
place of death
sex

[22] Items shown below are those which appear in the tabular summary forms which serve as specifications for decentralized compilation of death statistics at subnational geographic levels. These summaries include all deaths except those of infants who die before registration *(présentés sans vie)*. Centralized compilation of cause of death has been under experimentation in Western Flanders and in the Province of Antwerp. Items included on the special declaration of death used in the experiment are as follows:

cause of death (immediate, underlying)
certifier (signature)
citizenship
date of birth
date of certification
date of death
death registration number
deaths due to external violence:
  manner of occurrence
  nature of occurrence
hospital, institution, etc.
industry
legitimacy (if under five years)
marital status
name of deceased
name of spouse
occupation
place of birth
place of registration
place of residence
sex

[23] Items shown below are those which appear on the individual certificates of death issued by the physician and sent to the National Health Service. Coroners' certificates give in addition the following:

identifying characteristics of body (tatoo, etc.)
manner of death (natural, accident, homicide, etc.)
place of inquest
signs of violence

[24] Items shown below are those which appear on the individual certificate of death prepared jointly by civil registrar and district medical officer and sent to the Central Statistical Office. Items appearing on the medical certificate prepared by civil registrar and medical attendant are the same as those below with the addition of "hospitalization" and "autopsy performed?" The monthly list of deaths registered in the parish and civil registers includes only the following:

date of birth
date of birth of father and mother (if under 16 years)
date of death
date of registration
death registration number
marital status
name of deceased
name of father and mother (if under 16 ye
occupation
place of birth
place of registration
place of residence
sex

[25] Items shown below are those which appear
dividual statistical report of death prepared b
and on the separate medical certificate of ca
which appear on the list transcript of the regis
follows:

age
cause of death
date of burial
date of death
death registration number
name of deceased
occupation
place of residence

[26] This individual form was revised in 1952 w
dition of the following items:

if deceased female, number of children
  number still living
is deceased's father living or dead?
was deceased a member of a multiple birth

[27] Items shown below are a combination of t
appear on the individual report of death (for
persons whose birth was registered prior to c
the confidential medical certification. For the it
statistical report of death of infants born aliv
before registration of birth, see Table 15.

[28] Items shown below are those which appe
nominative list of deaths sent by civil and ec
registrars to the Central Bureau of Statistics.
dential (statistical) medical certificates of deat
quarterly by the health officers to the Central
Statistics for the control of the nominative li
tabulation of cause of death. The medical cer
cludes the following items:

attendant at death (name, address)
basis of certification, i.e., autopsy, examina
  or after death
cause of death (1948 International Form)
certifier (name, address)
date of birth
date of birth of surviving spouse
date of certification
date of death
date of marriage
deaths due to accident:

Syria[19]	Thailand[28]	Turkey[21]	Austria	Belgium[22]	Czechoslovakia	Denmark[23]	Finland[24]	France	German Federal Republic[19]	Greece	Iceland[25]	Ireland	Italy[26]	Liechtenstein[19]	Luxembourg	Netherlands[27]	Norway[28]	Poland	Portugal	Spain[19]	Sweden[29]	Switzerland	United Kingdom: England and Wales	United Kingdom: Northern Ireland	United Kingdom: Scotland[23]	Yugoslavia[19]	Oceania: Australia[21]	Oceania: New Zealand	Line number
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	X	—	—	—	—	—	—	—	44
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	45
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	46
—	X	X[56]	X	—	X	X[56]	X[56]	X	X	X	X	—	X	X	X	X	X	X	X	—	X[56]	X	—	—	X	—	X	X	47
—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	48
—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	49
—	X	X	X	—	X	—	—	—	—	X	—	—	—	X	X	X	X	—	—	—	—	X	—	—	—	—	—	—	50
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	51
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	52
—	—	—	X	—	X	—	—	X	—	—	—	—	X	—	X	X	—	X	—	—	—	X	—	—	—	X	—	—	53
—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	X	—	54
—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	55
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	X	—	—	—	—	—	—	—	—	—	56
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X[45]	—	—	57
—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	58
—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	59
—	—	—	—	—	—	—	X	X	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	60
—	X	—	—	—	—	X[44]	—	—	—	—	—	—	X	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	61
																													62
—	—	—	X	—	X	X	X	X	—	—	—	X	X	—	X	—	X	—	X	—	—	—	—	X	X	—	—	—	63
—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	64
—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	65
—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	66

marital status
name of deceased
name of father and mother (if under 16 years)
occupation
place of birth
place of registration
place of residence
sex

[23] Items shown below are those which appear on the individual statistical report of death prepared by registrar and on the separate medical certificate of cause. Items which appear on the list transcript of the register are as follows:

age
cause of death
date of burial
date of death
death registration number
name of deceased
occupation
place of residence

[24] This individual form was revised in 1952 with the addition of the following items:

if deceased female, number of children born and number still living
is deceased's father living or dead?
was deceased a member of a multiple birth?

[27] Items shown below are a combination of those which appear on the individual report of death (for deaths of persons whose birth was registered prior to death) and the confidential medical certification. For the items on the statistical report of death of infants born alive who die before registration of birth, see Table 15.

[28] Items shown below are those which appear on the nominative list of deaths sent by civil and ecclesiastical registrars to the Central Bureau of Statistics. The confidential (statistical) medical certificates of death are sent quarterly by the health officers to the Central Bureau of Statistics for the control of the nominative list and the tabulation of cause of death. The medical certificate includes the following items:

attendant at death (name, address)
basis of certification, i.e., autopsy, examination before or after death
cause of death (1948 International Form)
certifier (name, address)
date of birth
date of birth of surviving spouse
date of certification
date of death
date of marriage
deaths due to accident:
manner of occurrence
occupational injury?
place of occurrence
time of occurrence
duration of life in hours and minutes (if under 24 hours)
legitimacy (if under two years)
marital status
name
occupation
place of birth
place of death (hospital)
place of residence
sex

[29] Items shown below are those which appear on the individual form (printed card). The medical certificate includes, in addition, the following items:

cause of death
principal (and nomenclature number)
additional causes
deaths due to external violence:
manner of injury
nature of occurrence
hospitalization?
legitimacy (if under two years)
medical certifier (name)

[30] Items shown below are a combination of those which appear on the list return of deaths registered and on the confidential statement.

[31] Statistical report varies slightly among states. Items shown below are those which appear on a nationally standardized statistical transcript list of deaths registered in each state.

[32] Collected in 1950 by means of the International Form of Medical Certification of Cause of Death (1948 revision) in Canada, Guatemala, Panama, the United States, Uruguay, Venezuela, Israel, Japan, Thailand, Norway, England and Wales, and New Zealand; by means of International Form (1938 revision) in Bolivia, Paraguay, Philippines, and until 1952, Netherlands; by means of national modifications of International Form in Cuba, Mexico, Chile, Ecuador, Austria, Czechoslovakia, Denmark, Greece, Iceland, Italy, Luxembourg, and Switzerland.

[33] Selected causes of death are abstracted from the registers for use of the Health Department.

[34] Give also geographic place of occurrence.

[35] Geographic place only.

[36] From supplementary particulars concerning sudden death (gummed to medical certificate).

[37] Available indirectly from the medical certificate of death.

[38] Distinguishing only those registered in month of occurrence from those delayed.

[39] For Canada, Panama, the United States, Bolivia, Ecuador, Venezuela, Israel, the Philippines, Greece, Iceland, Ireland, Italy, Portugal, and Switzerland, only with reference to medical practitioner who certified the cause.

[40] See also "Place of death registration"; where deaths are registered in place of occurrence, either item should give "Place of death (geographic)".

[41] Only whether same as place of residence or not.

[42] See also "Place of death (geographic)"; where deaths are registered in place of occurrence, either item should give "Place of death registration".

[43] Of surviving or deceased female spouse only.

[44] If deceased under one year of age.

[45] If deceased under five years of age.

[46] Was birth registered?

[47] Only for liveborn infants dead before registration of birth.

[48] Hours for infants under one day only.

[49] Only if deceased is female.

[50] Age-limited as follows: Japan, Venezuela, Denmark, German Federal Republic, Greece, Finland, Italy, and Scotland, if deceased under one year; Norway, if deceased under two years; Austria, France, Iceland, Luxembourg, Spain, Switzerland, and Yugoslavia, if deceased under five years; Portugal, if deceased under six years; Argentina, Czechoslovakia, if deceased under 14 years.

[51] For suicides only.

[52] If widowed or divorced, also date of dissolution of marriage. For Sweden, divorce date only.

[53] Ethnic group.

[54] If foreign born, length of stay in country; for Israel, "date of immigration".

[55] "Urban" or "rural" only.

[56] Place of population registration.

[57] Item on report but data not collected since 1940 constitutional reform.

[58] No direct question; indicated as "0" in the age column.

[59] Age-limited as follows: Chile, if deceased under one year; Portugal, if under six years; Argentina, if under 14 years.

[60] If deceased under 14 years of age.

[61] Age-limited as follows: Chile and France, if deceased under one year; Argentina and Luxembourg, if under three years; Finland, if under 18 years.

[62] Age-limited as follows: Chile, Czechoslovakia, Denmark, France, and Scotland, if deceased under one year; Portugal, if under six years; Argentina, Austria, Luxembourg, if under 14 years; Italy, Norway, if under 15 years; Finland, if under 18 years.

Table 15. Items of Statistical

(Items are those of sta
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included in the statisti

Line number	Statistical items	Africa	America, North											America, South							
		Egypt[1]	Canada[2]	Costa Rica[3]	Cuba[4]	Dominican Republic	El Salvador[5]	Guatemala[6]	Haiti[7]	Honduras[8]	Mexico[9]	Nicaragua	Panama[10]	United States[11]	Argentina[8]	Bolivia[12]	Brazil[13]	Chile[14]	Colombia[15]	Ecuador	Paraguay[16]
	I. CHARACTERISTICS OF EVENT OR FOETUS																				
1	Cause of stillbirth (foetal death)	X	X	X	X	—	X	X	X	—	X	X	X	X	—	X	—	X	X	X	X
2	Complications of pregnancy and labour	—	—	—	—	—	—	—	—	—	—	—	X	X	—	X	—	—	—	—	—
3	Mode of delivery (natural or artificial)	—	X	—	—	—	—	—	X	—	—	—	X	—	—	—	—	—	—	—	—
4	Operations for delivery and nature of procedure	—	X	—	—	—	—	X	—	—	—	—	X	X	—	X	—	—	—	—	X
	Time of death:																				
5	Before, during, after labour[35]	—	X	—	X	—	—	—	—	—	—	—	X	—	—	X	—	—	X	X	X
6	Before, during operation	—	X	—	—	—	—	—	—	—	—	—	X	—	—	X	—	—	—	—	X
7	Was there an autopsy?	—	X	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—
8	Certifier or attendant	X	X	X	X	X	X	X	—	X	X	X	X	X	—	X	—	X	X	X	X
9	Citizenship (legal nationality)	—	—	—	—	—	X	X	—	—	—	—	—	—	—	—	—	—	—	—	—
10	Date of delivery	X	X	X	X	X	X	X	X	—	—	—	X	X	X	X	X	X	X	X	X
11	Date of registration	X	X	X	—	X	X	X	—	X	X	X	X	X	X	X	X	X	—	X	—
12	Duration of stay in place of death[39]	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
13	Hospitalization (see Place of delivery, line 29)																				
14	Identification number[39]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15	Industry[39]	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—
16	Legitimacy	—	X	X	X	X	X	X	X	X	X	X	X	X	X	—	X	X	X	X	—
17	Legitimate or illegitimate	—	—	X	—	X	X	X	X	—	—	X	—	X	X	—	X	X	X	—	—
18	Are parents married to each other?	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—
19	Marital status of mother and/or father	—	—	—	X	X	—	X	—	X	X	—	X	—	—	—	—	—	—	—	—
20	Length of foetus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21	Literacy[39]	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22	Marital status[39]	X	—	X	—	—	X	X	—	—	—	—	—	—	—	—	—	—	—	—	—
23	Name	—	X	X	—	—	X	X	—	—	—	—	X	X	—	—	X	X	—	—	—
24	Nationality (see Citizenship, line 9)																				
25	Occupation[39]	X	—	—	—	—	X	X	—	—	—	—	—	—	—	—	—	—	—	—	—
26	Origin[39]	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Period of gestation:																				
27	Months	X	—	X	X	—	X	—	—	—	X	X	X	—	—	X	—	X	X	—	—
28	Weeks	—	X	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	X	—
29	Place of delivery (geographic)[41]	—	X[42]	—	—	X	—	X	X	X	—	—	X	X	—	X[42]	—	—	(43)	X	X
30	Hospital or institution	X	X	X	—	X	X	X	X	—	—	—	X[42]	X	—	X	X	X	—	X	X
31	Place of registration[46]	X	X	X	—	X	X	X	—	—	X	X	—	X	X	X	X	X	X	X	X
32	Place of residence[39]	X	—	X	—	—	X	X	—	—	—	—	—	—	—	—	—	—	—	—	—
33	Premature or full term	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
34	Race or colour	—	—	X	X[47]	X	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—
35	Registration number	X	X	X	—	X	X	X	X	—	X	—	X	X	X	—	X	X	—	X	X
36	Religion[39]	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
37	Sex	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
38	Stillbirth, live birth, or death	X	—	X	—	—	X[48]	X	X	X[49]	—	—	—	—	X	—	—	—	—	—	—
39	Type of birth	X	X	—	—	X	X	X	X	X	—	X	X	X	X	—	X	X	X	X	—
	If plural:																				
40	Order of this birth	—	X	—	—	—	—	X	—	—	—	—	X	X	—	—	—	—	X	X	—
41	Other stillborn and liveborn	X	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	X	—
42	Registration number(s) of mate(s)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
43	Sex of mate(s)	X	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	X	—	—
44	Weight of foetus	—	—	—	—	—	—	X	—	—	—	—	—	X	—	—	—	—	—	—	—

[1] Items shown below are those which appear on the health-bureau-area list reports of live birth and of death, which together are used for statistical reporting of stillbirths in areas having health bureaux. For information collected in non-health-bureau areas, see notes to Tables 13 and 14.

[2] Statistical report varies slightly among provinces. Items shown below are those which appear on the individual stillbirth report used in British Columbia.

[3] Items shown below are those which appear on the list report of deaths, which was used in 1950 for statistical reporting of stillbirths also. Since 1950, individual certificates of live birth and of death have replaced the birth and death lists, and one of each is now required for reporting of stillbirths. For items included on each of the revised forms, see notes to Tables 13 and 14.

[4] Items shown below are those which appear on the individual *Certificado de defunción para fetos*, prepared by the medical attendant for the Dirección General de Salubridad and which, prior to 1950, was used for compilation of stillbirth statistics. At present, no statistics are compiled.

[5] Items shown below are a combination of those which appear on the list reports of live birth and death in use 1 January 1950 for statistical reporting of stillbirths. The use of individual certificates of foetal death to replace the two lists is under experimentation in selected areas.

[6] Items shown below are a combination of those which appear on the individual reports of live birth and of death which together are used for statistical reporting of stillbirths.

[7] Items shown below are those which appear on the list report of live births which is used also for reporting of stillbirths, and on the tabulations of causes of stillbirth by sex for each district, each prepared monthly by the hospitals and sent to the Direction générale de la santé publique.

[8] Items shown below are those which appear on the list report of live births, which is used also for reporting of stillbirths.

[9] Items shown below are those which appear on the individual report of stillbirth in use 1 January 1950. As of 1 January 1952, the individual form was replaced by a list which includes the following items:

age of mother
attendant at delivery
cause of stillbirth
date of registration
marital status of mother
period of gestation (months)
place of registration
sex
stillbirth registration number

[10] Items shown below are those which appear on the individual transcript of stillbirth registration used in 1950 by the Departamento de Salud Pública. A revised transcript which was introduced by the Dirección de Estadística y Censo beginning 1953 contains the following items:

age of mother and father
attendant
autopsy?
cause of stillbirth (1948 International Form)
date of delivery
date of registration
legitimacy
name of mother and father
operation? (findings)
period of gestation (months)
place of delivery (hospital)
place of registration
place of residence of mother
sex
stillbirth registration number
time of death (before or after labour?)
total number of children born to mother, including this one (born alive, still living; born alive, now dead; stillborn)
type of birth
if multiple, order of this birth
weight of foetus

[11] Items shown below are those which appear on the Standard Certificate of Stillbirth (1949 revision) to which the certificates of most states conform closely. A proposed revision of this certificate to cover all foetal deaths will include, in addition, the following items:

autopsy?
cause of foetal death according to 1948 International Form
time of death of foetus (before, during labour, or undetermined)

Table 15. Items of Statistical Information Included in Statistical Report of Stillbirth: 61 Countries, as of 1 January 1950

(Items are those of statistical interest on the report from which national stillbirth statistics are prepared. Those which may be obtainable from answers to other questions (for example, hospitalization from interpretation of addresses or legitimacy from absence of data on father) are not indicated. An "X" indicates that the item named in the stub was included in the statistical report for the country shown in the box-head. A dash "—" indicates that the item was not included. Two dots ". ." indicate that the item is not applicable.)

	North America						America, South										Asia												Europe			
	Haiti[7]	Honduras[8]	Mexico[9]	Nicaragua	Panama[10]	United States[11]	Argentina[8]	Bolivia[12]	Brazil[13]	Chile[14]	Colombia[15]	Ecuador	Paraguay[16]	Peru[8]	Uruguay	Venezuela[17]	Burma[13]	Ceylon[19]	India[20]	Indonesia[21]	Israel[6]	Japan	Jordan[22]	Lebanon[22]	Philippines[6]	Syria[23]	Thailand[24]	Turkey[25]	Austria[26]	Belgium[23]	Czechoslovakia[26]	Denmark[27]
	X	—	X	X	X	X	—	X	—	X	X	X	X	—	X	X	—	—	—	—	X	X	. .	. .	X	—	X	X	—	—	—	X
	—	—	—	—	X	X	—	X	—	—	—	—	—	—	X	—	—	—	—	—	—	—	. .	. .	—	—	—	—	—	—	—	—
	X	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	. .	. .	—	—	—	—	—	—	—	X
	—	—	—	—	X	X	—	X	—	—	—	—	X	—	X	X	—	—	—	—	—	—	. .	. .	—	—	—	—	—	—	—	—
	—	—	—	—	X	—	—	X	—	—	X	X	X	—	X	—	—	—	—	X	X	—	. .	. .	—	—	—	—	—	X	—	—
	—	—	—	—	X	—	—	X	—	—	—	—	X	—	X	—	—	—	—	—	—	—	. .	. .	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	. .	. .	X	—	—	—	—	—	—	—
	—	X	X	X	X	X	—	X	—	X	X	X	X	—	X	X	—	—	—	—	X	X	. .	. .	X	—	X	—	—	—	X	X
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	X	—	. .	. .	X	—	X	X	—	—	—	—
	X	—	—	—	X	X	X	X	X	X	X	X	X	X	X	X	—	—	—	X	X	X	. .	. .	X	—	X	X	X	(37)	X	X
	—	X	X	X	X	X	X	X	X	X	—	X	—	X	—	—	X	X	X	X	X	X	. .	. .	X	X[38]	X	—	X	X	X	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	. .	. .	X	—	X	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	. .	. .	—	—	—	X	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	. .	. .	—	—	—	—	—	—	—	—
	X	X	X	X	X	X	X	—	X	X	X	X	—	X	X	X	—	—	—	X	X	X	. .	. .	X	—	—	—	X	X	X	X
	X	—	—	X	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	X	. .	. .	—	—	—	—	X	—	X	—
	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	X	—	. .	. .	—	—	—	—	—	—	—	—
	—	X	X	—	X	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	X	—	. .	. .	X	—	—	—	X	—	X	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	. .	. .	—	—	—	—	—	—	X	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	. .	. .	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	. .	. .	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	X	—	. .	. .	—	—	—	—	—	—	—	—
	—	—	—	—	X	X	—	—	—	—	—	—	—	—	—	X	—	—	—	—	X	—	. .	. .	X	—	X	X	X	—	X	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	X	—	. .	. .	X	—	X	X	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	. .	. .	—	—	—	—	—	—	—	—
	—	—	X	X	X	—	—	X	—	X	X	—	—	—	—	X	—	—	—	—	—	X	. .	. .	—	—	X	—	—	—	—	—
	—	—	—	—	—	X	—	—	—	—	—	X	—	—	X	—	—	—	—	—	—	X	. .	. .	—	—	—	—	—	—	—	X
	X	X	—	—	X	X	—	X[42]	—	—	(43)	X	X	X	X	X	X	(44)	—	X	X	X	. .	. .	X	—	X	X	X	—	X	X
	X	—	—	—	X[42]	X	—	X	X	X	—	X	X	—	X	X	—	X	—	X	X	X	. .	. .	—	—	—	X	X	—	X	X
	—	—	X	X	—	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	. .	. .	X	X	X	—	X	X	X	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	X	—	. .	. .	X	—	X	X	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	. .	. .	—	—	—	—	—	—	X	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	. .	. .	—	—	—	—	—	—	—	—
	X	—	X	—	X	X	X	—	X	X	—	X	X	—	X	X	—	—	—	—	X	X	. .	. .	X	—	X	—	X	—	X	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	. .	. .	—	—	X	—	—	—	X	—
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	. .	. .	X	X	X	X	X	X	X	X
	X	X[49]	—	—	—	—	X	—	—	—	—	—	—	X	—	X[18]	—	—	—	—	X	—	. .	. .	X	—	X	X[48]	X	—	X	—
	X	X	—	X	X	X	X	—	X	X	X	X	—	X	X	—	—	X	—	X	X	X	. .	. .	X	—	X	—	X	—	X	—
	—	—	—	—	X	X	—	—	—	—	X	X	—	—	X	—	—	—	—	—	—	X	. .	. .	X	—	—	—	—	—	—	—
	—	—	—	X	—	—	—	—	—	—	—	X	—	X	—	—	—	—	—	—	—	X	. .	. .	—	—	—	—	X	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	. .	. .	—	—	—	—	X	—	—	—
	—	—	—	X	—	—	—	—	—	—	X	—	—	X	—	—	—	—	—	—	—	X	. .	. .	—	—	—	—	—	—	—	—
	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	. .	. .	—	—	—	—	—	—	X	—

[11] Items shown below are those which appear on the Standard Certificate of Stillbirth (1949 revision) to which the certificates of most states conform closely. A proposed revision of this certificate to cover all foetal deaths will include, in addition, the following items:

- autopsy?
- cause of foetal death according to 1948 International Form
- time of death of foetus (before, during labour, or undetermined)
- cause of stillbirth (1948 International Form)
- date of delivery
- date of registration
- legitimacy
- name of mother and father
- operation? (findings)
- period of gestation (months)
- place of delivery (hospital)
- place of registration
- place of residence of mother
- sex
- stillbirth registration number
- time of death (before or after labour?)
- total number of children born to mother, including this one (born alive, still living; born alive, now dead; stillborn)
- type of birth
- if multiple, order of this birth
- weight of foetus

[12] Items shown below are those which appear on the individual health-unit-area report of stillbirth, prepared jointly by civil registrar and medical practitioner, and sent to the Dirección General de Estadística and the Dirección General de Sanidad.

- age of mother and father
- attendant
- cause of stillbirth
- date of delivery (including hour)
- labour induced?
- legitimacy
- name of mother and father
- number of children born to this mother (total liveborn; born alive, still living; stillborn)
- occupation of mother and father
- operation?
- period of gestation
- place of birth of mother and father
- place of delivery (hospital)
- place of residence of mother
- race or colour
- sex
- type of birth

[13] Items shown below are those which appear on the list report of live births (used also for reporting stillbirths) sent by civil registrars to the Department of Demographic, Moral and Political Statistics. In 1953, the National Health Department was compiling statistics of foetal death attended by physicians from individual forms prepared by the attendant. The items included in this foetal-death report are as follows:

- age of mother
- attendant
- cause of stillbirth
- date of registration
- legitimacy
- number of children born to this mother, inc
  - one
- period of gestation
- place of registration
- place of residence of mother
- sex
- stillbirth registration number

The revised statistical report (individual), March 1954 replaced both the above, includes ing items to be completed by the civil registrar:

- age of mother and father
- cause of stillbirth
- certifier
- citizenship of mother and father
- date of delivery
- date of registration
- is mother married? (yes or no)
- name of mother
- number of children born to this mother, inc
  - one (born alive, still living; born alive, stillborn)

Countries, as of 1 January 1950

are prepared. Those which
rpretation of addresses or
em named in the stub was
tes that the item was not

Syria[31]	Thailand[34]	Turkey[35]	Europe: Austria[26]	Belgium[33]	Czechoslovakia[26]	Denmark[27]	Finland[8]	France[28]	German Federal Republic[23]	Greece[26]	Iceland[26]	Ireland[12]	Italy[29]	Liechtenstein[23]	Luxembourg	Netherlands[38]	Norway[39]	Poland[6]	Portugal	Spain[22]	Sweden[25]	Switzerland[21]	United Kingdom: England and Wales[26]	United Kingdom: Northern Ireland[23]	United Kingdom: Scotland[32]	Yugoslavia[23]	Oceania: Australia[13]	Oceania: New Zealand[24]	Line number
—	X	X	—	—	—	X	—	—	—	—	—	..	X	—	—	X	—	—	X	—	—	X	—	..	X	—	X	X	1
—	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	2
—	—	—	—	—	—	X	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	3
—	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	–	..	—	—	—	—	4
—	—	—	—	X	—	—	—	X	—	—	—	..	—	—	—	X	—	—	X	X	—	—	—	..	—	—	—	—	5
—	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	6
—	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	X	7
—	X	—	—	—	X	X	—	X	—	—	—	..	X	—	—	X	—	X	X	—	—	X	X[36]	..	X	—	X	X	8
—	X	X	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	X	X	—	..	—	—	—	—	9
—	X	X	X	(37)	X	X	X	X	X	X	X	..	X	X	X	X	X	X	X	X	X	X	X	..	X	X	X	X	10
X[38]	X	—	X	X	X	—	X	—	X	X	X	..	—	—	—	X	X	X	X	—	—	X	X	..	X	—	X	X	11
—	X	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	12
																													13
—	—	X	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	14
—	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	15
—	—	—	X	X	X	X	X	X	X	X	X	..	X	X	X	X	X	X	X	—	X	X	X	..	X	X	X	X	16
—	—	—	X	X	—	X	X	X	X	X	X	..	X	X	X	X	X	—	X	—	X	X	—	..	X	X	X	X	17
—	—	—	—	—	X	—	—	—	—	—	—	..	—	—	—	—	—	X	—	—	—	—	X	..	X	—	—	X	18
—	—	—	X	—	X	—	X	—	—	—	—	..	—	—	X[40]	X[40]	—	—	—	—	X	X[40]	—	..	—	—	—	—	19
—	—	—	—	—	X	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	20
—	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	21
—	X	X	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	X	—	22
—	X	X	X	—	X	—	X	—	—	X	X	..	X	—	X	—	X	X	—	—	X	—	X	..	—	—	—	—	23
																													24
—	X	X	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	X	—	25
—	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	26
—	X	—	—	—	—	—	—	X	—	—	—	..	X	—	—	—	—	—	X	—	—	—	—	..	—	—	—	X	27
—	—	—	—	—	—	X	—	—	—	—	—	..	—	—	—	X	—	—	—	—	—	—	—	..	—	—	—	—	28
—	X	X	X	—	X	X	X	—	—	X	X	..	—	X	X	—	X	—	X	—	X[45]	X	X	..	X	X	X	X	29
—	—	X	X	—	X	X	—	X	—	X	—	..	X	—	X	X	X	—	X	—	—	X	—	..	X	—	X	X	30
X	X	—	X	X	X	—	X	X	X	X	X	..	X	—	—	X	X	X	X	X	X	X	X	..	X	—	X	X	31
—	X	X	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	X	—	32
—	—	—	—	—	X	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	33
—	X	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	34
—	X	—	X	—	X	—	—	X	—	X	X	..	X	—	X	X	X	X	X	—	X	X	X	..	X	—	X	X	35
—	X	X	—	—	X	—	—	—	—	—	—	..	—	X	—	—	—	—	—	—	—	X	—	..	—	—	—	—	36
X	X	X	X	X	X	X	X	X	X	X	X	..	X	X	X	X	X	X	X	X	X	X	X	..	X	X	X	X	37
—	X	X[48]	X	—	X	—	X	—	—	X	X	..	X	X	—	—	X	X	—	—	X	X	X	..	—	—	X	X	38
—	X	—	X	—	X	—	X	X	—	X[50]	X	..	X[50]	—	X	X	X	X	X	X	X	X	X	..	X	X	X	X	39
—	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	X	—	—	..	—	—	X	X	40
—	—	—	X	—	—	—	X	X	—	—	—	..	—	—	X	X	—	—	X	X	X	—	X	..	X	X	—	—	41
—	—	—	X	—	—	—	—	X	—	X	X	..	X	—	X	X	X	—	—	—	—	—	X	..	X	—	—	—	42
—	—	—	—	—	—	—	X	X	—	—	—	..	X	—	—	X	X	—	—	—	X	—	—	..	X	X	—	—	43
—	—	—	—	—	X	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	44

[31] Items shown below are those which appear on the individual report of stillbirth sent by the civil registrars to the Servicio Nacional de Estadística y Censos. The list form collected by the Servicio Nacional de Salud includes only the following items:

age of mother
attendant
cause of stillbirth
date of registration
legitimacy
number of children born to this mother, including this one
period of gestation
place of registration
place of residence of mother
sex
stillbirth registration number

The revised statistical report (individual), which in March 1954 replaced both the above, includes the following items to be completed by the civil registrar:

age of mother and father
cause of stillbirth
certifier
citizenship of mother and father
date of delivery
date of registration
is mother married? (yes or no)
name of mother
number of children born to this mother, including this one (born alive, still living; born alive, now dead; stillborn)
occupation of mother and father
period of gestation (weeks)
place of birth of mother and father
place of delivery (home, hospital, etc.)
place of registration
place of residence of mother
sex
status of mother and father
stillbirth registration number
type of birth

[35] Stillbirths are not officially registered. Items shown below are those which appear on the individual statistical report prepared on the basis of burial permits.

[38] Items shown below are those which appear on the individual report of stillbirth used by the División de Bioestadística of the Ministerio de Salud Pública. The Dirección General del Registro Civil and the Dirección General de Estadística y Censos use the list report of deaths for statistical reporting of stillbirths.

[39] Items shown below are those which appear on the individual report of death (used also for statistical reporting of stillbirths) prepared jointly by civil registrars and medical attendants for use in the Ministerio de Sanidad y Asistencia Social. The individual report prepared by registrars for the Dirección General de Estadística includes only the following items:

citizenship
date of delivery
legitimacy
place of delivery
registration number
sex

An *Experimento sobre un sistema de estadísticas vitales* is being conducted; see Tables 13 and 14, note 15, for details. Items appearing on the experimental statistical transcript of foetal death are as follows:

age of mother and father
burial permit number
cemetery (name, location)
citizenship of mother and father
date of beginning of mother's last menstruation
date of delivery
date of registration
industry of mother and father
legitimacy *(reconocido (a))*
medical attendance? if so:
  autopsy? (findings)
  cause of foetal death
  certifier (name, address)
  conditions contributing to foetal death (maternal, foetal)
  operations for delivery and nature of procedure
  time of foetal death (before, during labour)
name of foetus
name of mother and father
number of children born to this mother, including this one (born alive, still living; born alive, now dead; stillborn)
occupation of mother and father
place of delivery (hospital)

(Table continued on next page)

Table 15. Items of Statistical Informati

Line number	Statistical items	Africa	America, North											America, South							
		Egypt[1]	Canada[2]	Costa Rica[3]	Cuba[4]	Dominican Republic	El Salvador[5]	Guatemala[6]	Haiti[7]	Honduras[8]	Mexico[9]	Nicaragua	Panama[10]	United States[11]	Argentina[8]	Bolivia[12]	Brazil[13]	Chile[14]	Colombia[15]	Ecuador	Paraguay[1]
	II. CHARACTERISTICS OF MOTHER																				
45	Age (see Date of birth, line 48)																				
46	Birth registration number	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
47	Citizenship (legal nationality)	X	X	—	—	X	X	X	—	X	—	—	—	—	X	X	X	—	—	—	—
48	Date of birth or age (at time of delivery)	X	X	—	X	X	X	X	—	X	X	—	X	X	X	X	—	X	X	X	X
49	Age	X	X	—	X	X	X	X	—	X	X	—	X	X	X	X	—	X	X	X	X
50	Date of birth	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—
51	Date of marriage	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
52	Duration of marriage	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
53	Industry	—	X	—	—	—	—	X	—	—	—	—	X	—	X	X	—	X	—	—	—
54	Language	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
55	Literacy or level of formal education	—	—	—	—	—	X	—	—	X	—	—	—	—	—	—	—	—	—	—	—
56	Name	—	X	—	X	—	X	X	—	—	—	—	X	X	—	X	—	—	X	X	X
57	Nationality (see Citizenship, line 47)																				
58	Number of children born	X	X	—	—	X	X	X	X	—	—	—	X	X	—	—	—	X	—	X	—
59	During her lifetime[52]	—	—	—	—	X	—	—	X	—	—	—	X	—	—	—	—	—	—	—	—
60	Liveborn	—	X	—	—	X	X	X	—	—	—	—	—	—	—	—	—	—	—	X	—
61	Born alive, still living	—	X	—	—	—	—	X	—	—	—	—	X	X	—	—	—	—	—	X	—
62	Born alive, now dead	—	—	—	—	—	X	—	—	—	—	—	X	X	—	—	—	—	—	—	—
63	Stillborn	—	X	—	—	X	X	X	—	—	—	—	X	X	—	—	—	X	—	X	—
64	During present marriage[53]	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
65	Liveborn	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
66	Born alive, still living	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
67	Born alive, now dead	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
68	Stillborn	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
69	Occupation	X	X	—	—	X	X	X	—	X	X	—	X	—	X	X	—	X	X	X	X
70	Origin	X	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
71	Place of birth	—	X	—	X	—	—	X	—	—	—	—	X	X	—	X	—	X	—	X	—
72	Place of residence	X	X	—	X	X	X	X	X	—	—	(43)	X	X	—	X	—	—	—	X	X
73	Race or colour	—	—	—	X[47]	X	—	X	—	—	—	—	X	X	—	X	—	—	—	X	—
74	Religion	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
75	Status (employer, employee, etc.)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—
	III. CHARACTERISTICS OF FATHER[57]																				
76	Age (see Date of birth, line 79)																				
77	Birth registration number	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
78	Citizenship (legal nationality)	X	X	—	—	X	X	X	—	X	—	—	—	—	X	—	X	—	—	X	—
79	Date of birth or age (at time of delivery)	X	X	—	—	X	X	X	—	X	—	—	X	X	X	—	—	X	X	X	—
80	Age	X	X	—	—	X	X	X	—	X	—	—	X	X	X	—	—	X	X	X	—
81	Date of birth	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—
82	Industry	—	X	—	—	—	—	X	—	—	—	—	X	X	X	—	—	X	—	—	—
83	Language	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
84	Literacy or level of formal education	—	—	—	—	—	X	—	—	X	—	—	—	—	—	—	—	—	—	—	—
85	Name	—	X	—	—	—	X	X	—	—	—	—	X	X	—	—	—	—	X	X	—
86	Nationality (see Citizenship, line 78)																				
87	Occupation	X	X	—	—	X	X	X	—	X	—	—	X	X	X	—	—	X	X	X	—
88	Origin	X	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
89	Place of birth	—	X	—	—	—	—	X	—	—	—	—	X	X	—	—	—	X	—	X	—
90	Place of residence	—	X	—	—	—	X	X	—	—	—	—	—	—	—	—	—	—	—	X	—
91	Race or colour	—	—	—	—	X	—	X	—	—	—	—	X	X	—	—	—	—	—	X	—
92	Religion	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93	Status (employer, employee, etc.)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—

place of registration
place of residence of mother
sex
status of mother and father
type of birth
if multiple, sex of mate(s) and whether liveborn or stillborn
weight of foetus

[18] Items shown below are those which appear in the tabular summary forms which serve as specifications for decentralized compilation of stillbirth statistics in each village tract, police circle, or town. Consideration is being given to replacing the summary by an individual statistical report of stillbirth and to centralizing compilation. Items suggested for collection are the following:

age of mother and father
attendant
cause of stillbirth
citizenship of mother and father
date of delivery
date of registration
name of mother and father
number of children born to this mother (born alive, still living; stillborn)
occupation of mother and father
period of gestation (months)
place of delivery
place of registration
place of residence of mother
race of mother and father
religion of mother and father
sex
status of father
stillbirth registration number
type of birth

[19] Items shown below are those which appear on the list report of stillbirths in "Proclaimed Areas"—those in which the registrar is a medical practitioner.

[20] It is not yet possible to compile national vital statistics, although consolidations are made at the national level of such state tabulations as are available (see Table 1, note 16). State tabulations are, in turn, tabular summaries of district compilations. Items shown below are those which appear in the tabular summary required of the various districts in the State of Madras.

[21] Items shown below are those which appear on the individual report used among European population for reporting true stillbirths and deaths of infants born alive who die before registration of birth. An experiment in voluntary registration is at present under way in the regency Banjumas in middle Java, and the items appearing on the individual report used are as follows:

citizenship
date of delivery
date of registration
name of mother and father
period of gestation
place of delivery (hospital)
place of registration
place of residence of mother
sex
stillbirth registration number

[22] Stillbirths are not officially registered, and no statistics are compiled from other sources, as they are in El Salvador, Honduras, Colombia, Peru, Syria, and Turkey.

[23] Items shown below are those which appear in the tabular summary forms which serve as specifications for decentralized compilation of stillbirth statistics at subnational geographic levels. National statistics are consolidations of these tabulations. For Belgium, items refer also to infants born alive who die before registration of birth (*présentés sans vie*); for Spain, items refer also to all infants who are born alive but who die before reaching 24 hours of age.

[24] Items shown below are a combination of those which appear on the individual reports of live birth and of death which together are used for the statistical reporting of stillbirths. Statistics are not compiled from these reports, however, but by consolidation of monthly tabular summaries of stillbirths which include for each registration locality, stillbirths by sex and age of mother.

[25] Items shown below are those which appear on the individual report for deaths in cities, used by the Central Statistical Office for reporting of stillbirths also.

[26] Items shown below are those which appear on the individual report of live births, which is used also for reporting of stillbirths.

Table 15. Items of Statistical Information Included in Statistical Report of Stillbirth: 61 Countries, as of 1 January 1950—*(Continued)*

North						America, South										Asia												Europe			
Haiti[7]	Honduras[8]	Mexico[9]	Nicaragua	Panama[10]	United States[11]	Argentina[8]	Bolivia[13]	Brazil[18]	Chile[14]	Colombia[15]	Ecuador	Paraguay[1]	Peru[8]	Uruguay	Venezuela[17]	Burma[18]	Ceylon[19]	India[20]	Indonesia[21]	Israel[8]	Japan	Jordan[13]	Lebanon[22]	Philippines	Syria[23]	Thailand[24]	Turkey[25]	Austria[26]	Belgium[27]	Czechoslovakia[26]	Denmark[27]
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	..	..	—	—	—	—	—	—	—	—
—	X	—	—	—	—	X	X	X	—	—	X	X	X	—	—	—	—	—	X	X	X	..	..	X	—	X	—	X[40]	—	—	—
—	X	X	—	X	X	X	X	—	X	X	X	X	X	X	—	—	X	—	X	X	X	..	..	X	—	X	—	X	—	X	X
—	X	X	—	X	X	X	X	—	X	X	X	X	X	X	—	—	X	—	X	—	—	..	..	X	—	X	—	—	—	—	X
—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	X	X	..	..	—	—	—	—	X	—	X	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	..	..	—	—	—	—	X	—	X	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	..	..	—	—	X	—	—	—	—	—
—	—	—	—	X	—	X	—	—	X	—	—	—	—	X	—	—	—	—	—	X	X	..	..	—	—	—	—	X	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	..	..	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	..	..	—	—	—	—	—	—	—	—
—	—	—	—	X	X	—	X	—	—	X	X	X	—	X	—	—	—	—	—	X	X	..	..	X	—	X	—	—	—	—	X
X	—	—	—	X	X	—	—	—	X	—	X	—	—	X	—	—	—	—	X	X	X	..	..	X	—	X	—	X	—	X[51]	X
X	—	—	—	X	—	—	—	—	—	—	—	—	—	X	—	—	—	—	X	X	X	..	..	X	—	X	—	—	—	X	X
—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	X	..	..	—	—	—	—	—	—	—	—
—	—	—	—	X	X	—	—	—	—	—	X	—	—	X	—	—	—	—	—	X	X	..	..	X	—	—	—	—	—	—	—
—	—	—	—	X	X	—	—	—	—	—	—	—	—	X	—	—	—	—	—	X	X	..	..	—	—	X	—	—	—	X	—
—	—	—	—	X	X	—	—	—	X	—	X	—	—	X	—	—	—	—	—	X	X	..	..	—	—	X	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X[54]	—	..	..	—	—	—	—	X[55]	—	X	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	..	..	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X[54]	—	..	..	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X[54]	—	..	..	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X[54]	—	..	..	—	—	—	—	—	—	—	—
—	X	X	—	X	—	X	X	—	X	X	X	X	X	X	—	—	—	—	X	X	X	..	..	X	—	X	—	X	—	X	X[40]
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	X	—	..	..	—	—	—	—	—	—	X[56]	—
—	—	—	—	X	X	—	X	—	X	—	X	—	—	X	—	—	—	—	X	X	X	..	..	X	—	X	—	—	—	—	—
X	—	—	(43)	X	X	—	X	—	—	—	X	X	—	X	—	—	X	—	X	X	X	..	..	X	—	X	—	X	—	X	X
—	—	—	—	X	X	—	X	—	—	—	X	—	X	X	—	—	—	—	—	—	—	..	..	—	—	X	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	..	..	X	—	—	—	X	—	X	—
—	—	—	—	—	—	—	—	—	X	—	—	—	X	—	—	—	—	—	—	—	—	..	..	—	—	—	—	X	—	X	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	..	..	—	—	—	—	—	—	—	—
—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	X	..	..	X	—	X	—	X	—	X	—
—	—	—	—	X	X	—	—	—	—	X	X	—	—	X	—	—	—	—	—	X	X	..	..	X	—	X	—	—	—	—	X
—	X	—	—	X	X	X	—	—	X	X	X	—	X	X	—	—	—	—	X	X	X	..	..	X	—	X	—	X	—	X	X
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	X	—	..	..	—	—	—	—	—	—	X[56]	—
—	—	—	—	X	X	—	—	—	X	—	X	—	—	X	—	—	—	—	—	X	X	..	..	X	—	X	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	X	X	—	..	..	X	—	—	—	—	—	X	—
—	—	—	—	X	X	—	—	—	—	—	X	—	X	X	—	—	—	—	—	—	—	..	..	—	—	X	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	..	..	X	—	—	—	X	—	X	—
—	—	—	—	—	—	—	—	—	X	—	—	—	X	—	—	—	—	—	—	—	—	..	..	—	—	—	—	X	—	X	—

appear on the list
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(see Table 1, note
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ed of the various

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population for re-
infants born alive
An experiment in
nder way in the
he items appearing
lows:

place of residence of mother
sex
stillbirth registration number

[22] Stillbirths are not officially registered, and no statistics are compiled from other sources, as they are in El Salvador, Honduras, Colombia, Peru, Syria, and Turkey.

[23] Items shown below are those which appear in the tabular summary forms which serve as specifications for decentralized compilation of stillbirth statistics at subnational geographic levels. National statistics are consolidations of these tabulations. For Belgium, items refer also to infants born alive who die before registration of birth (*présentés sans vie*); for Spain, items refer also to all infants who are born alive but who die before reaching 24 hours of age.

[24] Items shown below are a combination of those which appear on the individual reports of live birth and of death which together are used for the statistical reporting of stillbirths. Statistics are not compiled from these reports, however, but by consolidation of monthly tabular summaries of stillbirths which include for each registration locality, stillbirths by sex and age of mother.

[25] Items shown below are those which appear on the individual report for deaths in cities, used by the Central Statistical Office for reporting of stillbirths also.

[26] Items shown below are those which appear on the individual report of live births, which is used also for reporting of stillbirths.

[27] Items shown below are those which appear on the individual certificate of death issued for a stillborn child by the physician and sent to the National Health Service. Stillbirths are also reported with live births on the transcript of the register sent to the Statistical Office. The items on the transcript are the following:

birth registration number
date of birth of infant
date of birth of mother and father
date of marriage of mother and father
date of registration
if child illegitimate, industry and occupation of mother
industry of father
legitimacy
number of children born to this mother, excluding this birth
occupation of father
place of registration
place of residence of mother
sex
stillborn or liveborn
type of birth
if plural, other liveborn and stillborn and registration number(s) of mate(s)

[28] Items shown below are those which appear on the individual report used for reporting true stillbirths and deaths of infants born alive who die before registration of birth. For the Netherlands, a medical certificate of death is also used for statistical purposes; for items included, see Table 14.

[29] Items shown below are those which appear or
vidual report of live birth, which is used also for
of stillbirths. The form was revised in 1952 with
tion of the following items:

age of mother
details of recognition (for recognized illegitim
occupation of mother
status of mother

[30] Items shown below are those which appea
nominative list of stillbirths registered. A notifi
legitimate births by the attending midwife or med
titioner excludes registration information and ir
addition to those below the following:

condition of mate(s) in plural birth
place of birth of parents.

The midwives' notification for illegitimate births
additional items of a medical nature.

[31] Items shown below are a combination of the
appear on the individual reports of stillbirth ar
birth, which together are used for reporting of s

[32] Items shown below are a combination of the
appear on the list return of stillbirths registere
the confidential statement.

[33] Items shown below are a combination of the
appear on the nationally standardized statistical t
lists of live births and deaths, both of which are
reporting of stillbirths registered in states where
tion is compulsory. Since registration is not comp
Queensland and Tasmania, nor in Victoria until
tional stillbirth statistics are not available.

Syria[31]	Thailand[34]	Turkey[35]	Europe: Austria[28]	Belgium[23]	Czechoslovakia[26]	Denmark[27]	Finland[8]	France[28]	German Federal Republic[23]	Greece[26]	Iceland[26]	Ireland[22]	Italy[29]	Liechtenstein[23]	Luxembourg	Netherlands[28]	Norway[30]	Poland[3]	Portugal	Spain[23]	Sweden[26]	Switzerland[31]	United Kingdom: England and Wales[36]	United Kingdom: Northern Ireland[22]	United Kingdom: Scotland[32]	Yugoslavia[23]	Oceania: Australia[33]	Oceania: New Zealand[34]	Line number
																													45
—	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	X	—	—	..	—	—	—	—	46
—	X	—	X[40]	—	—	—	—	X	—	—	—	..	—	X	X[40]	—	X	—	X	—	X	—	—	..	—	—	—	—	47
—	X	—	X	—	X	X	X	X	X	X	X	..	X	—	X	X	X	X	X	—	X	X	X	..	X	X	X	X	48
—	X	—	—	—	—	X	—	—	—	X	—	..	—	—	—	—	—	—	X	—	—	—	X	..	X	X	X	X	49
—	—	—	X	—	X	—	X	X	X[40]	—	X	..	X	—	X	X	X	X	X	—	X	X	X	..	X	—	—	—	50
—	—	—	X	—	X	—	X	X	—	X	—	..	X	—	X	X	X	—	—	—	X	X	X	..	X	—	X	X	51
—	X	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	X	—	—	—	—	..	—	X	—	X	52
—	—	—	X	—	—	—	—	X	—	X	—	..	—	—	X	X	X	—	—	—	—	X	—	..	—	—	—	—	53
—	—	—	—	—	—	—	—	—	—	X	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	54
—	—	—	—	—	—	—	—	—	—	X	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	55
—	X	—	—	—	—	X	X	X	—	—	X	..	X	—	—	X	X	—	—	—	X	X	X	..	—	—	—	X	56
																													57
—	X	—	X	—	X[51]	X	X	X	—	X[51]	X	..	X	—	X	X	X	X	X	—	X	X	X	..	X	X	X	X	58
—	X	—	—	—	X	X	X	X	—	—	X	..	—	—	X	X	—	X	X	—	—	—	—	..	—	X	—	—	59
—	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	60
—	—	—	—	—	—	—	—	X	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	61
—	X	—	—	—	X	—	—	X	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	62
—	X	—	—	—	—	—	—	X	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	63
—	—	—	X[55]	—	X	—	X[55]	X[54]	—	—	—	..	X	—	—	X	X[54]	—	X	—	X[55]	—	X[54]	..	X[54]	—	X	X	64
—	—	—	—	—	—	—	—	—	—	X[54]	—	..	—	—	—	—	—	—	—	—	—	X[55]	—	..	—	—	—	—	65
—	—	—	—	—	—	—	—	X[54]	—	—	—	..	—	—	X	—	X[54]	—	—	—	—	X[55]	X[54]	..	X[54]	—	—	X	66
—	—	—	—	—	—	—	—	X[54]	—	—	—	..	—	—	—	—	—	—	—	—	—	X[55]	—	..	—	—	—	X	67
—	—	—	—	—	—	—	—	X[54]	—	X[54]	—	..	—	—	—	—	—	—	X	—	—	—	—	..	—	—	—	—	68
—	X	—	X	—	X	X[40]	X	X	—	X	X	..	—	—	X	X	X	—	X	—	—	X	—	..	X	—	—	—	69
—	—	—	—	—	X[56]	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	70
—	X	—	—	—	—	—	—	—	—	—	—	..	—	—	—	X	—	—	—	—	—	—	—	..	—	—	X	X	71
—	X	—	X	—	X	X	—	X	X	X	X	..	—	X	X	X	X	X	X	—	—	X	—	..	X	—	X	X	72
—	X	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	X	73
—	—	—	X	—	X	—	—	—	—	X	—	..	—	X	X	X	X	—	—	—	—	X	—	..	—	—	—	—	74
—	—	—	X	—	X	—	—	X	—	—	—	..	—	—	X	X	—	X	—	—	—	X	—	..	—	X	—	—	75
																													76
—	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	X	—	—	..	—	—	—	—	77
—	X	—	X	—	—	—	—	—	—	—	—	..	—	X	X	—	X	—	X	—	X	—	—	..	—	—	—	—	78
—	X	—	—	—	X	—	X	X	—	X	X	..	—	—	X	X	X	X	X	—	X	—	—	..	—	—	X	X	79
—	X	—	—	—	—	—	—	—	—	X	—	..	—	—	—	—	—	—	X	—	—	—	—	..	—	—	X	X	80
—	—	—	—	—	X	—	X	X	—	—	X	..	—	—	X	X	X	X	—	—	X	—	—	..	—	—	—	—	81
—	—	—	X	—	—	—	—	X	—	X	—	..	—	—	X	X	X	—	—	—	—	X	—	..	—	—	—	—	82
—	—	—	—	—	—	—	—	—	—	X	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	83
—	—	—	—	—	—	—	—	—	—	X	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	84
—	X	—	—	—	—	X	X	X	—	—	X	..	X	—	—	X	X	—	—	—	X	X	X	..	—	—	—	X	85
																													86
—	X	—	X	—	X	X	X	X	—	X	X	..	X	—	X	X	X	—	X	—	X	X	X	..	X	—	X	X	87
—	—	—	—	—	X[56]	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	88
—	X	—	—	—	—	—	—	—	—	—	—	..	—	—	—	X	—	—	—	—	—	—	—	..	—	—	X	X	89
—	—	—	—	—	X	—	—	—	—	—	X	..	—	X	—	X	X	X	—	—	X	X	—	..	X	—	—	X	90
—	X	—	—	—	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	..	—	—	—	X	91
—	—	—	X	—	X	—	—	—	—	X	—	..	—	X	X	X	X	—	—	—	—	X	—	..	—	—	—	—	92
—	—	—	X	—	X	—	—	X	—	—	—	..	X	—	X	X	—	X	—	—	—	X	—	..	—	—	—	—	93

[29] Items shown below are those which appear on the individual report of live birth, which is used also for reporting of stillbirths. The form was revised in 1952 with the addition of the following items:

age of mother
details of recognition (for recognized illegitimates)
occupation of mother
status of mother

[30] Items shown below are those which appear on the nominative list of stillbirths registered. A notification of legitimate births by the attending midwife or medical practitioner excludes registration information and includes in addition to those below the following:

condition of mate(s) in plural birth
place of birth of parents.

The midwives' notification for illegitimate births includes additional items of a medical nature.

[31] Items shown below are a combination of those which appear on the individual reports of stillbirth and of live birth, which together are used for reporting of stillbirths.

[32] Items shown below are a combination of those which appear on the list return of stillbirths registered and on the confidential statement.

[33] Items shown below are a combination of those which appear on the nationally standardized statistical transcript lists of live births and deaths, both of which are used for reporting of stillbirths registered in states where registration is compulsory. Since registration is not compulsory in Queensland and Tasmania, nor in Victoria until 1953, national stillbirth statistics are not available.

[34] Items shown below are a combination of those which appear on the individual report of live births, used also for reporting of stillbirths, and the individual medical certificate of cause of stillbirth. In addition to the items shown below, "period of gestation" and "weight of foetus" were to be collected, beginning 1952.

[35] If born alive but died before registration of birth or before 24 hours of life completed, give duration of life in days for Belgium and Netherlands; in hours for Cuba, France, and Indonesia.

[36] No direct question; derived from question on nature of evidence on which registration of stillbirth is made.

[37] Only for *enfants présentés sans vie*.

[38] Distinguishing only those registered in month of occurrence from those delayed.

[39] Not applicable to reports of stillbirth; appears on reports of live birth or death used also for reporting stillbirths in certain countries.

[40] Only if birth illegitimate.

[41] See also "Place of registration"; where stillbirths are registered in place of occurrence, either item should give "Place of delivery (geographic)".

[42] Also length of stay of mother in place of delivery.

[43] "Urban" and "rural" only.

[44] Only whether same as place of residence of mother.

[45] Place where mother church-registered, irrespective of actual place of birth.

[46] See also "Place of delivery (geographic)"; where stillbirths are registered in place of occurrence, either item should give "Place of stillbirth registration".

[47] Items on form, but data not collected since 1940 constitutional reform.

[48] No direct question. Indicated as follows: El Salvador, "O" in age column; Venezuela, *feto* for name; Turkey, in cause column.

[49] Also whether died within 24 hours of birth.

[50] Also previous plural births to this mother.

[51] Also date of last previous birth, if any.

[52] In the Dominican Republic, Haiti, Panama, the United States, Israel, Denmark, France, the Netherlands and Portugal, questions relate to "previous issue" or "previous confinements", i.e., excluding this birth. In the Dominican Republic, Indonesia, Czechoslovakia, Finland, Iceland, Luxembourg, Poland and Yugoslavia, question is in terms of "birth order" and is assumed to include this birth, as it is in all remaining countries where reference is not clear.

[53] In Egypt, the Netherlands, Norway, Portugal, England and Wales, Scotland, Australia, and New Zealand, questions relate to "previous issue", i.e., excluding this stillbirth. In Austria, Czechoslovakia, Finland, Italy, and Sweden, question is in terms of "birth order" and is assumed to include this stillbirth, as it is in all remaining countries where reference is not clear.

[54] Also births during previous marriages, but separately.

[55] Including legitimized.

[56] Ethnic group.

[57] Limited in general to reports of "legitimate" stillbirths.

Table 16. Items of Statistical Information Included in Statistical Report of Marriage: 61 Countries, as of I

(Items are those of statistical interest on the report from which national marriage statistics are prepared. An "X" i that the item named in the stub was included in the statistical report for the country shown in the box-head. A da indicates that the item was not included. Three dots ". . ." indicate that no information is available. Two dots ". ." that the item is not applicable.)

Line number	Statistical items	Africa	America, North											America, South										Asia											
		Egypt	Canada[1]	Costa Rica[2]	Cuba[3]	Dominican Republic	El Salvador[4]	Guatemala	Haiti[5]	Honduras	Mexico[6]	Nicaragua	Panama	United States[7]	Argentina	Bolivia	Brazil	Chile[8]	Colombia[9]	Ecuador	Paraguay[10]	Peru	Uruguay[10]	Venezuela[11]	Burma[12]	Ceylon[13]	India[12]	Indonesia[14]	Israel	Japan	Jordan	Lebanon[7]	Philippines	Syria[7]	Thailand	Turkey
	I. CHARACTERISTICS OF EVENT																																		
1	Date of marriage	X	X	X	X	—	X	X	..	—	X	—	X	X	X	—	X	—	X	—	X	X	...	X	...	X	..	—	..	X	X	X	—	—	X	—	—	X
2	Date of marriage registration	X	X	—	X	X	X	X	..	—	X	X	X	X	X	X	X	X	—	X	...	X	...	—	..	X	..	X	X	X	X	X	X	X[18]	X	—
3	Marriage registration number	X	X	—	X	X	X	X	..	—	X	X	X	—	X	X	X	X	—	X	...	X	...	X	..	X	..	X	X	X	—	—	X	—	X	X
4	Place of marriage (geographic)[19]	X	X	—	—	X	—	X	..	X	—	—	X	X	—	—	—	—	X	—	...	X	...	X	..	—	..	—	X	X	X	—	X	—	—	X
5	Place of marriage registration[20]	X	X	X	X	X	X	X	..	—	X	X	X	X	X	X	X	X	—	X	...	X	...	X	..	X	..	X	X	X	X	X	X	X	X	—
6	Type of marriage (civil, religious, customary)	X[21]	—	X	—	—	—	X[22]	..	—	—	—	X	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	—	—
7	Officiant	—	X	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	X	..	X	..	—	—	—	X	—	X	—	—	—
	II. CHARACTERISTICS OF BRIDE																																		
8	Age (see Date of birth, line 10)																																		
9	Citizenship (legal nationality)	X	X	X	—	X	X	X	..	X	X	X	X	—	X	—	X	—	X	X	..	X	...	X	..	—	..	X	X	X	X	—	X	—	X	X
10	Date of birth or age	X	X	X	X	X	X	X	..	X	X	X	X	X	X	X	X	X	X	X	...	X	...	X	..	X	..	X	X	X	X	—	X	—	X	X
11	Age	X	X	X	X	X	X	X	..	X	X	X	X	X	X	X	X	X	X	X	...	X	...	X	..	X	..	X	—	—	X	—	X	—	X	—
12	Date of birth	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	X	—	—	...	—	...	—	..	—	..	—	X	X	—	—	—	—	X	X
13	Identification number	—	—	—	—	—	—	X	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	X	—	—	—	—	—	—	—
14	Industry	—	X	—	—	—	—	—	..	—	—	—	—	—	—	—	—	X	—	—	...	—	...	—	..	—	..	—	X	—	—	—	—	—	—	—
15	Language spoken and/or mother tongue	—	—	—	—	—	—	—	..	—	X	—	—	—	—	X	—	—	—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	—	—
16	Legitimacy	—	—	—	—	—	X	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	—	—
17	Literacy or level of formal education	—	—	X	—	X	X	X	..	X	X	X	—	—	—	X	—	X	—	X	...	X	...	X	..	X	..	—	—	X	X	—	—	—	—	—
18	Marital status	X	X	X	X	X	X	X	..	X	X	X	X	—	X	X	X	X	X	X	...	X	...	X	..	X	..	X	X	X	X	—	X	—	—	X
19	Name	—	X	—	—	—	X	X	..	—	—	—	—	—	—	X	X	X	X	X	...	—	...	X	..	—	..	—	X	X	—	—	X	—	X	—
20	Nationality (see Citizenship, line 9)																																		
21	Number of children legitimized by this marriage	X[23]	—	—	—	X	—	—	..	—	—	—	X	—	—	X	—	X	—	—	...	—	...	—	..	—	..	X	—	—	—	—	—	—	—	—
22	Number of previous marriages (see line 27)																																		
23	Occupation	—	X	X	X	X	X	X	..	X	X	X	—	—	—	X	X	X	X	X	...	X	...	X	..	—	..	X	X	X	—	—	X	—	X	X
24	Origin	X	X	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	X	—	—	—	—	—	—	—	—
25	Place of birth	—	X	—	X	—	—	—	..	—	X	—	—	—	—	—	—	X	X	—	...	—	...	—	..	—	..	X	X	X	—	—	—	—	X	X
26	Place of residence	X	X	—	—	X	(25)	(25)	..	—	X	(25)	—	X	—	—	—	X	(25)	—	...	—	...	—	..	X	..	X	X	X	X	—	X	—	X	—
27	Previous marriages:																																		
28	Date of dissolution of last marriage	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	—	X	—	—	—	—	—	—
29	Number of children	X	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	X	—	X	—	—	—	—	—
30	Number of previous marriages	X[27]	—	—	—	X	—	X	..	—	X	—	—	X	—	—	—	X	X	—	...	—	...	—	..	—	..	—	—	X	X	—	—	—	—	—
31	Race or colour	—	—	—	—	X	—	X	..	—	—	—	—	X	—	X	—	—	—	X	...	X	...	—	..	X	..	—	—	—	—	—	—	—	X	—
32	Relationship to groom	—	—	—	—	X	—	—	..	—	X	—	—	—	—	—	X	—	—	—	...	—	...	X	..	—	..	—	—	—	—	—	—	—	—	—
33	Religion	X	X	—	—	X	—	X	..	—	X	—	—	—	—	—	—	—	—	—	...	—	...	X	..	—	..	—	X	—	X	X	—	—	—	—
34	Status (employer, employee, etc.)	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	X	—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	—	—
	III. CHARACTERISTICS OF GROOM																																		
35	Age (see Date of birth, line 37)																																		
36	Citizenship (legal nationality)	X	X	X	—	X	X	X	..	X	X	X	X	—	X	—	X	—	X	X	..	X	...	X	..	—	..	X	X	X	X	—	X	—	X	X
37	Date of birth or age	X	X	X	X	X	X	X	..	X	X	X	X	X	X	X	X	X	X	X	...	X	...	X	..	X	..	X	X	X	X	—	X	—	X	X
38	Age	X	X	X	X	X	X	X	..	X	X	X	X	X	X	X	X	X	X	X	...	X	...	X	..	X	..	X	—	—	X	—	X	—	X	—
39	Date of birth	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	X	—	—	...	—	...	—	..	—	..	—	X	X	—	—	—	—	X	X
40	Identification number	—	—	—	—	—	—	X	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	X	—	—	—	—	—	—	—
41	Industry	—	X	—	—	—	—	—	..	—	—	—	—	—	X	—	—	X	—	—	...	—	...	—	..	—	..	—	X	—	—	—	—	—	—	—
42	Language spoken and/or mother tongue	—	—	—	—	—	—	—	..	—	X	—	—	—	—	X	—	—	—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	—	—
43	Legitimacy	—	—	—	—	—	X	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	—	—
44	Literacy or level of formal education	X	—	X	—	X	X	X	..	X	X	X	—	—	—	X	—	X	—	X	...	X	...	X	..	X	..	—	—	X	X	—	—	—	—	—

Items of Statistical Information Included in Statistical Report of Marriage: 61 Countries, as of 1 January 1950

Items are those of statistical interest on the report from which national marriage statistics are prepared. An "X" indicates hat the item named in the stub was included in the statistical report for the country shown in the box-head. A dash "—" ndicates that the item was not included. Three dots ". . ." indicate that no information is available. Two dots ". ." indicate that the item is not applicable.)

America, South						*Asia*												*Europe*																								*Oceania*		
																																						United Kingdom						
Colombia[9]	*Ecuador*	*Paraguay*[10]	*Peru*	*Uruguay*[10]	*Venezuela*[11]	*Burma*[12]	*Ceylon*[13]	*India*[12]	*Indonesia*[11]	*Israel*	*Japan*	*Jordan*	*Lebanon*[7]	*Philippines*	*Syria*[7]	*Thailand*	*Turkey*	*Austria*	*Belgium*	*Czechoslovakia*	*Denmark*	*Finland*	*France*	*German Federal Republic*[7]	*Greece*	*Iceland*	*Ireland*	*Italy*[15]	*Liechtenstein*	*Luxembourg*	*Netherlands*	*Norway*	*Poland*	*Portugal*	*Spain*[7]	*Sweden*	*Switzerland*	*England and Wales*	*Northern Ireland*	*Scotland*[16]	*Yugoslavia*[7]	*Australia*[17]	*New Zealand*	*Line number*
X	X	...	X	...	X	..	—	..	X	X	X	—	—	X	—	—	X	X	X	X	X	X	X	X	X	X	X	X	—	X	X	X	X	X	—	X	X	X	X	X	X	—	X	1
—	X	...	X	...	—	..	X	..	X	X	X	X	X	X	X[18]	X	—	X	—	X	X	—	—	X	X	X	X	X	X	—	—	X	X	X	—	—	X	—	X	X	—	X	X	2
—	X	...	X	...	X	..	X	..	X	X	X	—	—	X	—	X	X	X	X	X	X	X	X	—	X	X	X	X	—	X	X	X	X	X	—	—	X	X	X	X	—	X	X	3
X	—	...	X	...	X	..	—	..	—	X	X	X	—	X	—	—	X	—	—	—	—	—	—	—	X	X	X	—	X	—	X	X	—	X	—	—	—	X	X	X	X	X	—	4
—	X	...	X	...	X	..	X	..	X	X	X	X	X	X	X	X	—	X	X	X	X	X	X	X	X	X	X	X	—	X	—	—	X	X	X	X	X	X	X	X	—	X	X	5
—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	X	—	—	X	—	X	X	—	X	—	X	X	X	—	X	—	6
—	—	...	—	...	X	..	X	..	—	—	—	X	—	X	—	—	—	—	—	—	—	—	—	—	—	—	X	X	—	—	—	X	—	—	—	—	—	X	X	X	—	—	X	7
																																												8
X	X	..	X	...	X	..	—	..	X	X	X	X	—	X	—	X	X	X	X	—	—	—	X	X	X	X	—	X	X	X	X	X	—	X	—	X	X	—	—	—	—	—	—	9
X	X	...	X	...	X	..	X	..	X	X	X	X	—	X	—	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	10
X	X	...	X	...	X	..	X	..	X	—	—	X	—	X	—	X	—	—	—	—	—	—	—	X			X	X	X	—	—	—	—	X	X	—	—	X	X	X	X	X	X	11
—	—	...	—	...	—	..	—	..	—	X	X	—	—	—	—	X	X	X	X	X	X	X	X	X	—	X	—	X	—	X	X	X	X	—	—	X	X	—	—	—	—	—	—	12
—	—	...	—	...	—	..	—	..	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	13
—	—	...	—	...	—	..	—	..	—	X	—	—	—	—	—	—	—	—	—	—	X	—	X	—	—	—	—	—	—	X	X	X	—	—	—	—	X	—	—	—	—	—	—	14
—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15
—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16
—	X	...	X	...	X	..	X	..	—	—	X	X	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	X	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	17
X	X	...	X	...	X	..	X	..	X	X	X	X	—	X	—	—	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	18
X	X	...	—	...	X	..	—	..	—	X	X	—	—	X	—	X	—	X	—	X	—	X	X	—	X	X	X	X	—	X	—	X	—	—	—	X	—	X	X	X	—	—	—	19
																																												20
—	—	...	—	...	—	..	—	..	X	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	X	X	X	X	—	—	X	X	—	—	—	—	—	—	—	—	21
																																												22
X	X	...	X	...	X	..	—	..	X	X	X	—	—	X	—	X	X	X	X	X	X	X	X	—	X	X	X	X	—	X	X	X	—	X	—	X	X	X	X	X	—	—	—	23
—	—	...	—	...	—	..	—	..	X	—	—	—	—	—	—	—	—	—	—	X[24]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	24
X	—	...	—	...	—	..	—	..	X	X	X	—	—	—	—	X	X	—	X	—	X	X	X	—	X	X	—	X	—	X	X	X	—	X	—	X	—	—	—	—	—	X	X	25
(25)	—	...	—	...	—	..	X	..	X	X	X	X	—	X	—	X	—	X	X	X	X	X	X	X	—	X	X	X	X	X	X	X	—	X	—	X	X	X	X	X	—	—	—	26
																																												27
—	—	...	—	...	—	..	—	..	—	—	X	—	—	—	—	—	—	—	X	X	—	—	X	—	X	—	—	—	—	—	—	—	—	—	—	—	X[26]	—	—	—	—	—	—	28
—	—	...	—	...	—	..	—	..	—	X	—	X	—	—	—	—	—	—	—	X	—	—	X	—	X	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	29
X	—	...	—	...	—	..	—	..	—	—	X	X	—	—	—	—	—	—	—	X	X	—	—	—	X	X	—	—	—	X	X	X	—	—	—	X	—	—	—	—	X	—	—	30
—	X	...	X	...	—	..	X	..	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	31
—	—	...	—	...	X	..	—	..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	X	X	—	X	X	—	—	—	—	—	—	—	—	32
—	—	...	—	...	X	..	—	..	—	X	—	X	X	—	—	—	—	X	—	X	(28)	—	—	—	X	X	—	X	X	X	X	X	—	—	—	—	X	—	—	—	—	—	—	33
—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	—	—	X	X	X	—	X	X	—	X	—	—	X	—	X	X	—	X	—	—	—	X	—	—	—	X	—	—	34
																																												35
X	X	...	X	...	X	..	—	..	X	X	X	X	—	X	—	X	X	X	X	—	—	—	X	X	X	X	—	X	X	X	X	X	—	X	—	X	X	—	—	—	—	—	—	36
X	X	...	X	...	X	..	X	..	X	X	X	X	—	X	—	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	37
X	X	...	X	...	X	..	X	..	X	—	—	X	—	X	—	X	—	—	—	—	—	—	—	X	X	—	X	X	X	—	—	—	—	X	X	—	—	X	X	X	X	X	X	38
—	—	...	—	...	—	..	—	..	—	X	X	—	—	—	—	X	X	X	X	X	X	X	X	X	—	X	—	X	—	X	X	X	X	—	—	X	X	—	—	—	—	—	—	39
—	—	...	—	...	—	..	—	..	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	40
—	—	...	—	...	—	..	—	..	—	X	—	—	—	—	—	—	—	—	—	—	X	—	X	—	—	—	—	—	—	X	X	X	—	—	—	—	X	—	—	—	—	—	—	41
—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	42
—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	43
—	X	...	X	...	X	..	X	..	—	—	X	X	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	X	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	44

(Table continued on next page)

Table 16. Items of Statistical Information Included in Statistical Report of Marriage: 61 Countries, as of 1 January 1950

Line number	Statistical items	Africa	America, North											America, South										Asia										
		Egypt	Canada[1]	Costa Rica[2]	Cuba[3]	Dominican Republic	El Salvador[4]	Guatemala	Haiti[5]	Honduras	Mexico[6]	Nicaragua	Panama	United States[7]	Argentina	Bolivia	Brazil	Chile[8]	Colombia[9]	Ecuador	Paraguay[10]	Peru	Uruguay[10]	Venezuela[11]	Burma[12]	Ceylon[13]	India[12]	Indonesia[14]	Israel	Japan	Jordan	Lebanon[7]	Philippines	Syria[7]	Thailand	Turkey
	III. CHARACTERISTICS OF GROOM (continued)																																	
45	Marital status	X	X	X	X	X	X	X	..	X	X	X	X	—	X	X	X	X	X	X	...	X	...	X	..	X	..	X	X	X	X	—	X	—	—	X
46	Name	—	X	—	—	—	X	X	..	—	—	—	—	—	—	X	X	X	X	X	...	—	...	X	..	—	..	—	X	X	—	—	X	—	X	—
47	Nationality (see Citizenship, line 36)																																			
48	Number of previous marriages (see line 53)																																			
49	Occupation	X	X	X	X	X	X	X	..	X	X	X	—	—	X	X	X	X	X	X	...	X	...	X	..	—	..	X	X	X	X	—	X	—	X	X
50	Origin	X	X	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	X	—	—	—	—	—	—	—	—
51	Place of birth	—	X	—	X	—	—	—	..	—	X	—	—	—	—	—	—	X	X	—	...	—	...	—	..	—	..	X	X	X	—	—	—	—	X	X
52	Place of residence	X	X	—	—	X	(25)	(25)	..	—	X	(25)	—	X	—	—	—	X	(25)	—	...	—	...	—	..	X	..	X	X	X	X	—	X	—	X	—
53	Previous marriages:																																			
54	Date of dissolution of last marriage	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	—	X	—	—	—	—	—	—
55	Number of children	X	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	X	—	X	—	—	—	—	—
56	Number of previous marriages	X[29]	—	—	—	X	—	X	..	—	X	—	—	X	—	—	—	X	X	—	...	—	...	—	..	—	..	—	—	X	X[29]	—	—	—	—	—
57	Race or colour	—	—	—	—	X	—	X	..	—	—	—	—	X	—	X	—	—	—	X	...	X	...	—	..	X	..	—	—	—	—	—	—	—	X	—
58	Relationship to bride	—	—	—	—	X	—	—	..	—	X	—	—	—	—	—	X	—	—	—	...	—	...	X	..	—	..	—	—	—	—	—	—	—	—	—
59	Religion	X	X	—	—	X	—	X	..	—	X	—	—	—	—	—	—	—	—	—	...	—	...	X	..	—	..	—	X	—	X	X	—	—	—	—
60	Status (employer, employee, etc.)	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	X	—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	—	—
	IV. CHARACTERISTICS OF PARENTS OF PARTICIPANTS																																			
61	Citizenship of fathers	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	—	—	—	—	X	—	—	—
6	Citizenship of mothers	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	—	—	—	—	X	—	—	—
63	Names of fathers	—	X	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	X	—	—	—	X	—	X	—
64	Names of mothers	—	X	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	—	—	—	—	X	—	X	—
6	Occupation of fathers	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	X	—	—	—	—	—	—	—
66	Occupation of mothers	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	—	—
67	Place of birth of fathers	—	X	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	X	—
6	Place of birth of mothers	—	X	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	X	—
	Place of residence of fathers	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	X	—	—	—	—	—	—	—
70	Place of residence of mothers	—	—	—	—	—	—	—	..	—	—	—	—	—	—	—	—	—	—	—	...	—	...	—	..	—	..	—	X	—	—	—	—	—	—	—

[1] Statistical report varies slightly among provinces. Items shown below are those which appear on the individual marriage report used in British Columbia.

[2] Items shown below are those which appear on the statistical *Tarjeta de Matrimonio* in use until 1952. Beginning 1 January 1953, the *Tarjeta* was replaced by two forms for collection of data on marriages:

(*a*) *Certificado de matrimonio católico*, completed by parish priests, containing the following items:
- age of bride and groom
- citizenship of bride and groom
- citizenship of parents of bride and groom
- date of marriage
- marital status of bride and groom
  - if widowed, name of deceased spouse
- name of bride and groom
- name of parents of bride and groom
- occupation of bride and groom
- place of marriage
- place of residence of bride and groom
- witnesses (name, place of residence, qualifications)

(*b*) List of marriages celebrated by civil authorities (*Cuadro de Nupcialidad Civil*), containing the following items:
- age of bride and groom
- citizenship of bride and groom
- date of marriage
- date of registration
- marital status of bride and groom
- marriage registration number
- occupation of bride and groom
- place of marriage
- place of registration
- place of residence

[3] Items shown below are those which appear on the list report sent to the Dirección General de Estadística. In addition, there is a list collected by the Oficina Nacional de los Censos Demográfico y Electoral, which includes the following items:
- age of bride and groom
- book and page of register
- date of marriage
- marital status of bride and groom

[4] Items shown below are those which appear on the list report of marriages in use 1 January 1950. The use of individual certificates (duplicates of registration record) to replace the list is under experimentation in selected areas.

[5] Prior to 1952, statistical reports of marriages were not collected. Beginning 1952, a list of marriages registered in the civil registry is being sent to the Institut haïtien de statistique. The items included in this list are as follows:
- age of bride and groom
- date of registration
- marital status of bride and groom
- marriage registration number
- occupation of bride and groom
- place of marriage
- place of registration
- place of residence of bride and groom
- type of marriage

[6] Items shown below are those which appear on the individual marriage report in use 1 January 1950 for places of 25,000 or more population. Of these, only the following are included in the list report for places under 25,000:
- age of bride and groom
- date of registration
- marriage registration number
- place of registration

The revised form (list), which replaced both the above as of 1 January 1952, includes the following items:
- age of bride and groom
- date of registration
- literacy of bride and groom
- marriage registration number
- occupation of bride and groom
- place of registration

[7] Items shown below are those which appear in the tabular summary forms which serve as specifications for decentralized compilation of marriage statistics at a subnational geographic level. National statistics are consolidations of these tabulations, except that in the United States, the tabulations are available for 8 states only; namely Connecticut, Delaware, Idaho, Iowa, Kansas, Maine, New Hampshire, and Tennessee.

[8] A revised report of marriage, also individual, was introduced beginning March 1954. It includes the following items:
- age of bride and groom
- citizenship of bride and groom
- date of marriage
- date of registration
- identification (*cédula*) number of bride and groom
- literacy of bride and groom
- marital status of bride and groom
- marriage registration number
- name of bride and groom
- number of children legitimized by this marriage
- number of previous marriages of bride and groom
- place of birth of bride and groom
- place of identification registration of bride and groom
- place of registration
- place of residence of bride and groom

[9] Items shown below are those which appear on the list of weddings performed by parish priests, from which statistics of marriages are compiled.

[10] Statistics compiled but form not available to Statistical Office.

[11] Items appearing on the experimental statistical transcript of marriage (for which details were given in Table 13) are as follows:
- age of bride and groom
- citizenship of bride and groom
- date of birth of bri
- date of marriage
- industry of bride a
- length of stay of b
- literacy of bride ar
- marital status of b
- marriage registrat
- name of bride and
- number of previou
- occupation of bride
- place of marriage
- place of registratic
- place of residence
- religion of bride ar
- status of bride and

[12] Civil registration pulsory; therefore, con from registration sour

[13] Items shown below report of marriages a monthly list report of lowing items:
- date of registratio
- marriage registrat
- marital status
- nationality

Statistical Information Included in Statistical Report of Marriage: 61 Countries, as of 1 January 1950—*(Continued)*

America, South						*Asia*										*Europe*																									*Oceania*		
																																United Kingdom											
Colombia[1]	*Ecuador*	*Paraguay*[8]	*Peru*	*Uruguay*[8]	*Venezuela*[11]	*Burma*[12]	*Ceylon*[13]	*India*[12]	*Indonesia*[14]	*Israel*	*Japan*	*Jordan*	*Lebanon*[7]	*Philippines*	*Syria*[7]	*Thailand*	*Turkey*	*Austria*	*Belgium*	*Czechoslovakia*	*Denmark*	*Finland*	*France*	*German Federal Republic*[7]	*Greece*	*Iceland*	*Ireland*	*Italy*[15]	*Liechtenstein*	*Luxembourg*	*Netherlands*	*Norway*	*Poland*	*Portugal*	*Spain*[7]	*Sweden*	*Switzerland*	*England and Wales*	*Northern Ireland*	*Scotland*[20]	*Yugoslavia*[7]	*Australia*[17]	*New Zealand*	*Line number*
X	X	...	X	...	X	..	X	..	X	X	X	X	—	X	—	—	X	X	X	X	X	X	X	—	X	X	X	X	—	X	X	X	X	X	—	X	X	X	X	X	X	45
X	X	...	—	...	X	..	—	..	—	X	X	—	—	X	—	X	—	X	—	X	—	X	X	—	X	X	X	X	—	X	—	X	—	—	X	—	X	X	X	—	—	—	46
																																											47
																																											48
X	X	...	X	...	X	..	—	..	X	X	X	X	—	X	—	X	X	X	X	X	X	X	—	X	X	X	X	—	X	X	X	—	X	—	X	X	X	X	X	—	X	X	49
—	—	...	—	...	—	..	—	..	X	—	—	—	—	—	—	—	—	—	—	X[24]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	50
X	—	...	—	...	—	..	—	..	X	X	X	—	—	—	—	X	X	—	X	—	X	X	X	—	X	X	—	X	—	X	X	X	—	X	—	X	—	—	—	—	X	X	51
(25)	—	...	—	...	—	..	X	..	X	X	X	X	—	X	—	X	—	X	X	X	X	X	X	—	X	X	X	X	X	X	X	X	X	X	—	X	X	X	X	X	—	—	X	52
																																											53
—	—	...	—	...	—	..	—	..	—	—	X	—	—	—	—	—	—	—	X	X	—	—	X	—	X	—	—	—	—	—	—	—	—	—	—	X[26]	—	—	—	—	—	—	54
—	—	...	—	...	—	..	—	..	—	X	—	X	—	—	—	—	—	—	—	X	—	—	X	—	X	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	55
X	—	...	—	...	—	..	—	..	—	—	X	X[29]	—	—	—	—	—	—	—	X	X	—	—	—	X	X	—	—	—	X	X	X	—	—	—	X	—	—	—	—	X	—	—	56
—	X	...	X	...	—	..	X	..	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	57
—	—	...	—	...	X	..	—	..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	X	X	—	X	X	—	—	—	—	—	—	—	—	58
—	—	...	—	...	X	..	—	..	—	X	—	X	X	—	—	—	—	X	—	X	(28)	—	—	—	X	X	—	X	X	X	X	X	—	—	—	—	X	—	—	—	—	—	—	59
—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	—	—	X	X	X	—	X	X	—	X	—	—	X	—	X	X	—	X	—	—	—	X	—	—	—	X	—	—	60
—	—	...	—	...	—	..	—	..	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	61
—	—	...	—	...	—	..	—	..	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	62
—	—	...	—	...	—	..	—	..	—	X	—	—	—	X	—	X	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	X	X	X	—	—	—	63
—	—	...	—	...	—	..	—	..	—	—	—	—	—	X	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	64
—	—	...	—	...	—	..	—	..	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	X	X	—	—	—	X	—	—	—	—	X	X	X	—	—	—	65
—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	X	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	66
—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	67
—	—	...	—	...	—	..	—	..	—	—	—	—	—	—	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	68
—	—	...	—	...	—	..	—	..	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	69
—	—	...	—	...	—	..	—	..	—	X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	70

groom

hich appear on the indi-
nuary 1950 for places of
e, only the following are
s under 25,000:

replaced both the above
ollowing items:

which appear in the
ve as specifications for
age statistics at a sub-
l statistics are consoli-
pt that in the United
ble for 8 states only;
Idaho, Iowa, Kansas,
essee.

[8] A revised report of marriage, also individual, was introduced beginning March 1954. It includes the following items:
age of bride and groom
citizenship of bride and groom
date of marriage
date of registration
identification (*cédula*) number of bride and groom
literacy of bride and groom
marital status of bride and groom
marriage registration number
name of bride and groom
number of children legitimized by this marriage
number of previous marriages of bride and groom
place of birth of bride and groom
place of identification registration of bride and groom
place of registration
place of residence of bride and groom

[9] Items shown below are those which appear on the list of weddings performed by parish priests, from which statistics of marriages are compiled.

[10] Statistics compiled but form not available to Statistical Office.

[11] Items appearing on the experimental statistical transcript of marriage (for which details were given in Table 13) are as follows:
age of bride and groom
citizenship of bride and groom
date of birth of bride and groom
date of marriage
industry of bride and groom
length of stay of bride and groom in place of residence
literacy of bride and groom
marital status of bride and groom
marriage registration number
name of bride and groom
number of previous marriages of bride and groom
occupation of bride and groom
place of marriage
place of registration
place of residence of bride and groom
religion of bride and groom
status of bride and groom

[12] Civil registration of marriage is not generally compulsory; therefore, compilation of statistics is not possible from registration sources. See also notes to Tables 1 and 2.

[13] Items shown below are those which appear on the list report of marriages among the General population. The monthly list report of Muslim marriages includes the following items:
date of registration
marriage registration number
marital status
nationality
officiant of marriage (name)
place of registration
The quarterly summary report of Kandyan marriages registered includes the following information:
age of bride and groom (highest, mean, lowest)
date of registration
literacy of bride and groom (whether made a mark)
marital status
place of registration
total number of persons under 21 years of age married classified by sex

[14] Items shown below are those which appear on the individual report of marriages among European population, for whom registration is compulsory.

[15] This individual form was revised in 1952, with the deletion of the question on "religion" and the addition of one on "consanguinity".

[16] Items shown below are those which appear on the duplicates of the register, from which the statistical punch card is prepared.

[17] Statistical report varies slightly among states. Items shown below are those which appear on a nationally standardized statistical transcript list of marriages registered in each state.

[18] Distinguishing those registered in month of occurrence from those delayed.

[19] See also "Place of marriage registration"; where marriages are registered in place of occurrence, either item should give "Place of marriage (geographic)".

[20] See also "Place of marriage (geographic)"; where marriages are registered in place of occurrence, either item should give "Place of marriage registration".

[21] There are five types of marriage for Moslems: (1) new marriage contracts, (2) "tasabok" (confirmation of unregistered union), (3) "ragaa" (marriage after legal separation or revocable divorce), (4) resumption of broken marriage *without* intervention of another husband, and (5) resumption of broken marriage *after* intervention of another husband (statistically considered as new marriage). In the case of "tasabok", the duration of the unregistered union and the number of children born are requested. In the case of revoked divorce ("ragaa") or of resumption of broken marriage, place, number, and date of divorce, as well as duration of separation, are requested.

[22] If "consensual" marriage, also number of children.

[23] See note 21 above.

[24] Ethnic group.

[25] "Urban" or "rural" only.

[26] Also date of celebration of previous marriage.

[27] Number of previous husbands; divorced and total.

[28] For persons of different churches, give faith in which the children are to be educated.

[29] Number of previous wives, under protection, divorced, and total.

Table 17. Items of Statistic

(Items are those of st
that the item named i
indicates that the item

Line number	Statistical items	Africa	America, North											America, South						
		Egypt	Canada[1]	Costa Rica[2]	Cuba[3]	Dominican Republic	El Salvador[4]	Guatemala	Haiti[5]	Honduras	Mexico[6]	Nicaragua	Panama[7]	United States[8]	Argentina[9]	Bolivia[7]	Brazil[9]	Chile[8]	Colombia[9]	Ecuador	Paraguay[8]
	I. CHARACTERISTICS OF DIVORCE																			
1	Alimony	—	...	—	—	—	—	—	..	—	X	—	...	—	..	...	..	..	..	—	..
2	Date of petition	—	...	—	X	—	—	—	..	—	X	—	...	—	..	...	..	..	..	—	..
3	Date of divorce or final court decision	X[21]	...	X	X	—	X	X	..	—	X[22]	—	...	X	..	...	..	..	..	—	..
4	Date of divorce registration	X	...	X	X	X	X	X	..	—	X	X	...	—	..	...	..	..	..	X	..
5	Fees paid	—	...	—	—	—	—	—	..	—	—	—	...	—	..	...	..	..	..	—	..
6	Grounds for divorce	X	...	X	X	X	X	X	..	X	X	X	...	X	..	...	..	..	..	—	..
7	Party found guilty	—	...	—	X	—	—	—	..	—	—	—	...	—	..	...	..	..	..	—	..
8	Party to whom divorce granted	—	...	—	—	—	—	X	..	—	—	—	...	X	..	...	..	..	..	—	..
9	Party who requested divorce (petitioner)	X	...	—	—	X	—	X	..	X	X	X	...	—	..	...	..	..	..	—	..
10	Place of divorce (geographic and/or court)[24]	X	...	X	X	—	—	X	..	X	—	X	...	X	..	...	..	..	..	X	..
11	Place of divorce registration[25]	X	...	—	—	X	X	X	..	—	X	—	...	—	..	...	..	..	..	X	..
12	Registration number	X	...	X	—	X	—	X	..	—	X	—	...	—	..	...	..	..	..	X	..
13	Separation prior to divorce	—	...	—	—	—	—	—	..	—	—	—	...	—	..	...	..	..	..	—	..
14	Date of	—	...	—	—	—	—	—	..	—	—	—	...	—	..	...	..	..	..	—	..
15	Name of court	—	...	—	—	—	—	—	..	—	—	—	...	—	..	...	..	..	..	—	..
16	Grounds for	—	...	—	—	—	—	—	..	—	—	—	...	—	..	...	..	..	..	—	..
17	Responsible person	—	...	—	—	—	—	—	..	—	—	—	...	—	..	...	..	..	..	—	..
18	Type of the divorce (mutual consent, other)	X[26]	...	—	—	—	—	—	..	X	X	X	...	—	..	...	..	..	..	—	..
	II. CHARACTERISTICS OF DIVORCEES																				
19	Age (see Date of birth, line 22)																				
20	Age at time of marriage	—	...	—	X	—	—	—	..	—	—	—	...	—	..	...	..	..	..	—	..
21	Citizenship (legal nationality)	X	...	X	—	X	X	X	..	X	—	—	...	—	..	...	..	..	..	—	..
22	Date of birth or age (at time of divorce)	X	...	X	—	X	X	X	..	X	X	X	...	—	..	...	..	..	..	—	..
23	Age	X	...	X	—	X	X	X	..	X	X	X	...	—	..	...	..	..	..	—	..
24	Date of birth	—	...	—	—	—	—	—	..	—	—	—	...	—	..	...	..	..	..	—	..
25	Date of marriage	—	..	—	X	—	X	X	..	X	X	—	...	—	..	...	..	..	..	—	..
26	Date of marriage registration	—	...	—	—	—	—	—	..	—	—	—	...	—	..	...	..	..	..	X	..
27	Duration of marriage	X	...	—	—	X	—	—	..	—	—	—	...	X	..	...	..	..	..	—	..
28	Identification number	—	...	—	—	—	—	—	..	—	—	—	...	—	..	...	..	..	..	—	..
29	Industry	—	...	—	—	—	—	—	..	—	—	—	...	—	..	...	..	..	..	—	..
30	Language spoken and/or mother tongue	—	...	—	—	—	—	—	..	—	—	—	...	—	..	...	..	..	..	—	..
31	Legitimacy	—	...	—	—	—	X	—	..	—	—	—	...	—	..	...	..	..	..	—	..
32	Literacy or level of formal education	X[28]	...	—	—	X	X	—	..	—	X	X	...	—	..	...	..	..	..	—	..
33	Marital status prior to marriage	—	...	—	—	—	—	—	..	—	X	—	...	—	..	...	..	..	..	—	..
34	Marriage registration number	—	...	—	—	—	—	—	..	—	—	—	...	—	..	...	..	..	..	—	..
35	Name	—	...	—	—	—	—	X	..	—	—	—	...	—	..	...	..	..	..	X	..
36	Nationality (see Citizenship, line 21)																				
37	Number of children	X	...	—	X	X	X	X	..	X	X	X	...	—	..	...	..	..	..	—	..
38	Age of[29]	—	...	—	X	—	—	X	..	X	X	X	...	—	..	...	..	..	..	—	..
39	Custody of	—	...	—	—	X	—	—	..	—	X	—	...	—	..	...	..	..	..	—	..
40	Sex of	—	...	—	X	X	X	X	..	—	X	X	...	—	..	...	..	..	..	—	..
41	Number of previous divorces	X[30]	...	—	X	X	—	—	..	—	X	—	...	—	..	...	..	..	..	—	..
42	Number of previous marriages	X	...	—	—	—	—	—	..	—	X	—	...	—	..	...	..	..	..	—	..
43	Occupation	X[28]	...	X	X	X	X	X	..	X	X	X	...	—	..	...	..	..	..	—	..
44	Origin	X	...	—	—	—	—	—	..	—	—	—	...	—	..	...	..	..	..	—	..
45	Place of birth	—	...	—	X	—	—	—	..	—	X	—	...	—	..	...	..	..	..	—	..
46	Place of marriage (geographic)	—	...	—	—	—	—	X	..	—	—	—	...	—	..	...	..	..	..	X	..
47	Place of marriage registration	—	...	—	—	—	—	—	..	—	—	—	...	—	..	...	..	..	..	—	..
48	Place of residence (at time of divorce)	X[28]	...	X	—	X	(33)	X	..	—	X	—	...	—	..	...	..	..	..	—	..
49	Place of residence (last common)	—	...	—	—	—	—	—	..	—	—	—	...	—	..	...	..	..	..	—	..
50	Race or colour	—	...	—	—	X	—	X	..	—	—	—	...	—	..	...	..	..	..	—	..
51	Religion	X	...	—	—	X	—	X	..	—	X	—	...	—	..	...	..	..	..	—	..
52	Status (employer, employee, etc.)	—	...	—	—	—	—	—	..	—	—	—	...	—	..	...	..	..	..	—	..
53	Type of marriage (civil, religious, customary)	—	...	—	—	—	—	—	..	—	—	—	...	—	..	...	..	..	..	—	..

[1] National divorce statistics are consolidations of subtotals prepared for provincial registration offices by chief registrars of divorce courts or by the clerk of the Divorce Committee of the Senate. Only one province has a registration of divorce form, which is still in the experimental stage.

Items included are as follows:

action contested?
citizenship of divorcees
custody of minor children (by age and sex)
date of birth of divorcees
date of marriage
date of divorce registration
date of decree
date of separation
divorce registration number (court/civil registry)
grounds for divorce
informant (name, title)
level of formal education of divorcees
name of divorcees
number of children of this marriage
number of previous marriages of divorcees (manner of dissolution)
origin of divorcees
petitioner
place of birth of divorcees
place of divorce (geographic)
place of last common residence of divorcees
place of marriage
place of divorce registration
religion of divorcees
type of decree

[2] This list of divorce petitions, prepared by the clerk of the court, was revised beginning January 1953 to include, in addition, the following items:

duration of marriage
number of children born
which spouse requested divorce (petitioner)

[3] Statistics of divorce are not compiled, but divorce decrees are reported to the Dirección General de Estadística by the courts on a list which includes the items below. In addition, a list report is collected by the Oficina Nacional de los Censos Demográfico y Electoral, which includes the following items:

age of parties at marriage
date of final action
date of marriage
date of registration
divorce registration number
grounds for divorce
number of children by sex

Items shown below are those which appear on the list report in use 1 January 1950. The use of individual certificates (duplicates of registration record) to replace the list is under experimentation in selected areas.

[5] Prior to 1952, statistical reports of divorce were not collected. Beginning 1952, a list of divorces registered in the civil registry is being sent to the Institut haïtien de statistique. The items included in this list are as follows:

age of divorcees
date of divorce registration
grounds for divorce
number of children and sex
place of divorce registration
place of residence at time of divorce

[6] Items shown below are those which appear on the individual divorce report in use 1 January 1950. As of 1 January 1952, the individual report was replaced by a list which includes the following items:

citizenship of divorcees
date of divorce decree
date of marriage being dissolved
date of registration
divorce necessary or voluntary?
divorce registration number
grounds for divorce
place of registration

[7] Statistical report not available to the Statistical Office of the United Nations.

[8] Items shown below are those which appear in the tabular summary forms which serve as specifications for decentralized compilation of divorce statistics at a subnational geographic level. National statistics are consolidations of these tabulations, except that in the United States, the tabulations are available for 11 states only, namely, Florida, Iowa, Michigan, Mississippi, Nebraska, New Hampshire, Oregon, South Dakota, Tennessee, Virginia, Wyoming.

Table 17. Items of Statistical Information Included in Statistical Report of Divorce: 61 Countries, as of 1 January 1950

(Items are those of statistical interest on the report from which national divorce statistics are prepared. An "X" indicates that the item named in the stub was included in the statistical report for the country shown in the box-head. A dash "—" indicates that the item was not included. Three dots ". . ." indicate that no information is available. Two dots ". ." indicate that the item is not applicable.)

	North					America, South									Asia										Europe				
	Haiti[5]	Honduras	Mexico[6]	Nicaragua	Panama[7]	United States[8]	Argentina[9]	Bolivia[7]	Brazil[9]	Chile[9]	Colombia[9]	Ecuador	Paraguay[9]	Peru[10]	Uruguay[7]	Venezuela[11]	Burma[12]	Ceylon[13]	India[14]	Indonesia[15]	Israel	Japan	Jordan	Lebanon[6]	Philippines[9]	Syria[6]	Thailand	Turkey	Austria	Belgium[8]
		—	X	—		—						—				—			—	—	X	—	—	—		—	—	—	—	—
		—	X			—						—				—			—	X	X	—				—	X	—	—	—
		—	X[22]	—		X						—				X	X		—	X	X	X	—			—	X	X	—	X
		—	X	X		—						X				—			X	X	—	X	X		X[23]	X	—	—	X	X
		—	—	—		—						—				—			—	—	—	X				—	—	—	—	X
		X	X	X		X						—				X	X		X	X	X	X	—			—	X	X	—	X
		—	—	—		—						—				—			—	—	—	—	—			—	—	X	—	X
		—	—	—		X						—				—			—	—	—	—	—			—	—	—	—	—
		X	X	X		—						—				X	X		—	X	X	X	—			—	X	—	—	X
		X	—	X		X						X				X	X		X	X	X	X	—			—	X	X	—	X
		—	X	—		—						X				—			X	X	X	X	X		X	—	—	—	—	—
		—	X	—		—						X				—			X	X	X	X	—			—	X	X	—	X
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		—	—	—		—						—				—	—		—	—	—	—	—			—	—	—	—	—
		X	—	—		—						—				X	—		X[27]	X	X	X	—			—	X	—	—	X
		X	X	X		—						—				X	—		—	X	X	X	—			—	X	X	X	X
		X	X	X		—						—				X	—		—	—	—	X	—			—	X	X	X	X
		—	—	—		—						—				—	—		—	X	X	—	—			—	X	—	—	X
		X	X	—		—						—				—	—		X	X	X	—	—			—	—	—	X	X
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		—	X	X		—						—				X	—		X	X	X	—	—			—	—	—	—	—
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		—	X	—		—						—				X	—		—	—	—	X	—			—	—	—	—	—
		X	X	X		—						—				X	—		—	X	X	X[28]	—			—	—	X	X	X
		—	—	—		—						—				—	—		—	—	—	—	—			—	—	—	—	—
		—	X	—		—						—				—	—		—	X	X	—	—			—	—	—	—	—
		—	—	—		—						X				X	—		X	X	X	—	—			—	—	—	—	—
		—	—	—		—						—				—	X		—	—	—	—	—			—	X	—	—	—
		—	X	—		—						—				—	—		—	X[34]	X	X	—			—	X	—	—	X
		—	—	—		—						—				—	—		—	—	—	—	—			—	—	X	—	—
		—	—	—		—						—				X	—		—	—	—	—	—			—	X	—	—	—
		—	X	—		—						—				X	—		—	X	—	X	X			—	—	—	—	—
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age of divorcees
date of divorce registration
grounds for divorce
number of children and sex
place of divorce registration
place of residence at time of divorce

[9] Items shown below are those which appear on the individual divorce report in use 1 January 1950. As of 1 January 1952, the individual report was replaced by a list which includes the following items:

citizenship of divorcees
date of divorce decree
date of marriage being dissolved
date of registration
divorce necessary or voluntary?
divorce registration number
grounds for divorce
place of registration

[7] Statistical report not available to the Statistical Office f the United Nations.

[8] Items shown below are those which appear in the abular summary forms which serve as specifications for decentralized compilation of divorce statistics at a subnational geographic level. National statistics are consolidations of these tabulations, except that in the United States, the tabulations are available for 11 states only, namely, Florida, Iowa, Michigan, Mississippi, Nebraska, New Hampshire, Oregon, South Dakota, Tennessee, Virginia, Wyoming.

[9] Divorce, in the sense used here, does not exist.

[10] Divorces are registered on margin of the marriage register, but no statistics are compiled either from this register or from court records.

[11] Items shown below are those which appear on the individual report prepared by the court authorities for the Dirección General de Estadística. Items appearing on the experimental statistical transcript of divorce (for which details are given in Table 13) are as follows:

age of divorcees
citizenship of divorcees
date of birth of divorcees
date of divorce
date of marriage being dissolved
decree number
divorce file number
industry of divorcees
literacy of divorcees
name of divorcees
number of children under 16 years of age
number of previous marriages of divorcees
occupation of divorcees
place of divorce
place of marriage being dissolved
place of registration
place of residence of divorcees
status of divorcees

[12] Divorces are registered only as part of records of court concerned and no statistical report is made, but in Northern Ireland, statistics of the number of petitions are

[13] Items shown below are those which appear o report of divorces among the General populat monthly list report of Muslim divorces includes th ing items:

date of registration
divorce granted by whom?
divorce registration number
duration of marriage being dissolved
name of officiant [of divorce]
nature of divorce ("Talak" or "Fasah")
place of registration
race of divorcees

The list report of Kandyan divorces registered the following items:

date of registration
divorce registration number
duration of marriage being dissolved
grounds for divorce
place of registration
type of marriage ("Diga" or "Binna") being
which spouse requested divorce (petitioner)

[14] Civil registration of divorce is not compulsory of population, so compilation of statistics is not from registration sources. See also notes to Table

[15] Items shown below are those which appear on vidual report of divorces among European popul whom registration is compulsory.

Countries, as of 1 January 1950

prepared. An "X" indicates
the box-head. A dash "—"
able. Two dots ". ." indicate

Asia			Europe																										Oceania		
																									United Kingdom						
Syria[6]	Thailand	Turkey	Austria	Belgium[6]	Czechoslovakia	Denmark	Finland	France	German Federal Republic[6]	Greece	Iceland[7]	Ireland[9]	Italy[9]	Liechtenstein[18]	Luxembourg	Netherlands[16]	Norway[17]	Poland	Portugal	Spain[9]	Sweden	Switzerland	England and Wales	Northern Ireland[12]	Scotland[18]	Yugoslavia[5]	Australia[10]	New Zealand[20]	Line number
—	—	—	—	—	—	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	—	. .	—	—	—	. .	. . .	—	—	X	1
—	—	X	—	—	—	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	X	—	. .	—	—	X	. .	. . .	—	X	X	2
—	—	X	X	—	X	X	X	X	X	X	. . .	. .	. .	. .	X	X	X	X	X	. .	X	X	X	. .	. . .	X	X	X[22]	3
X[23]	X	—	—	—	X	X	—	—	X	X	. . .	. .	. .	. .	X	X	—	X	X	. .	—	X	X	. .	. . .	—	—	—	4
—	—	—	—	—	—	X	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	—	. .	—	—	—	. .	. . .	—	—	—	5
—	—	X	X	—	X	X	X	—	X	X	. . .	. .	. .	. .	X	—	—	X	X	. .	—	X	X	. .	. . .	—	X	X	6
—	—	—	X	—	X	—	—	—	X	—	. . .	. .	. .	. .	—	—	—	X	—	. .	—	X	—	. .	. . .	—	—	—	7
—	—	—	—	—	—	—	—	X	—	—	. . .	. .	. .	. .	X	—	—	—	—	. .	—	—	—	. .	. . .	—	—	—	8
—	—	X	—	—	X	—	X	—	X	X	. . .	. .	. .	. .	X	—	X	X	—	. .	—	X	X	. .	. . .	—	X	X	9
—	—	X	X	—	X	X	X	—	—	—	. . .	. .	. .	. .	—	X	X	X	X	. .	—	X	X	. .	. . .	X	X	X	10
X	X	X	—	X	—	—	—	X	X	X	. . .	. .	. .	. .	X	—	—	—	—	. .	X	—	—	. .	. . .	—	—	—	11
—	X	X	X	—	X	X	—	X	—	X	. . .	. .	. .	. .	X	X	X	X	X	. .	—	X	X	. .	. . .	—	X	X	12
—	—	—	—	—	X	X	—	X	—	—	. . .	. .	. .	. .	—	—	X	—	—	. .	—	X	—	. .	. . .	—	—	—	13
—	—	—	—	—	X	X	—	—	—	—	. . .	. .	. .	. .	—	—	X	—	—	. .	—	X	—	. .	. . .	—	—	—	14
—	—	—	—	—	X	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	—	. .	—	X	—	. .	. . .	—	—	—	15
—	—	—	—	—	X	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	—	. .	—	—	—	. .	. . .	—	—	—	16
—	—	—	—	—	X	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	—	. .	—	—	—	. .	. . .	—	—	—	17
—	—	—	—	—	—	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	X	. .	—	—	—	. .	. . .	—	—	—	18
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—	—	—	—	—	—	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	—	. .	—	—	—	. .	. . .	—	—	X	20
—	X	—	—	—	X	—	—	X	X[28]	X	. . .	. .	. .	. .	X	—	—	—	X	. .	—	X	—	. .	. . .	—	—	—	21
—	X	X	X	X	X	X	X	X	X	X	. . .	. .	. .	. .	X	X	X	X	X	. .	X	X	X	. .	. . .	—	X	—	22
—	X	X	X	X	—	—	—	—	X	X	. . .	. .	. .	. .	—	—	—	—	X	. .	—	—	X	. .	. . .	—	X	—	23
—	X	—	—	—	X	X	X	X	—	—	. . .	. .	. .	. .	X	X	X	X	—	. .	X	X	—	. .	. . .	—	—	—	24
—	—	—	X	—	X	X	X	X	X	X	. . .	. .	. .	. .	X	X	X	X	—	. .	X	X	X	. .	. . .	—	X	—	25
—	X	—	—	—	—	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	X	. .	—	—	—	. .	. . .	—	—	—	26
—	—	X	—	X	—	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	X	. .	—	—	—	. .	. . .	X	X	X	27
—	—	—	—	—	—	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	—	. .	X	—	—	. .	. . .	—	—	—	28
—	—	—	—	—	—	—	—	X	—	X	. . .	. .	. .	. .	—	X[28]	—	—	—	. .	—	X	—	..	. . .	—	—	—	29
—	—	—	—	—	—	—	—	—	—	X	. . .	. .	. .	. .	—	—	—	—	—	. .	—	—	—	. .	. . .	—	—	—	30
—	—	—	—	—	—	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	—	. .	—	—	—	. .	. . .	—	—	—	31
—	—	X	—	—	—	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	—	. .	—	—	—	. .	. . .	—	—	—	32
—	—	—	—	—	—	—	—	X	—	X	. . .	. .	. .	. .	—	—	—	—	X	. .	—	—	X	. .	. . .	—	—	X	33
—	X	—	—	—	—	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	X	. .	—	—	—	. .	. . .	—	—	—	34
—	X	—	—	—	X	—	X	X	—	X	. . .	. .	. .	. .	X	—	X	—	—	. .	X	—	—	. .	. . .	—	—	—	35
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—	—	X	X	—	X	X	X	X	X	X	. . .	. .	. .	. .	X	X	X	X	X	. .	X	X	X	. .	. . .	X	X	X	37
—	—	—	—	—	X	—	—	—	X	X	. . .	. .	. .	. .	X	X	—	X	X	. .	—	X	—	. .	. . .	—	—	—	38
—	—	—	—	—	—	X	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	—	. .	—	X	—	. .	. . .	—	—	—	39
—	—	—	—	—	—	—	—	—	—	X	. . .	. .	. .	. .	—	X	—	—	—	. .	—	—	—	. .	. . .	—	—	—	40
—	—	—	—	—	X	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	—	. .	X	—	—	. .	. . .	—	—	—	41
—	—	—	—	—	X	—	—	—	—	—	. . .	. .	. .	. .	X	—	—	—	—	. .	—	—	—	. .	. . .	—	—	—	42
—	—	X	X	—	X	X	X	X	—	X	. . .	. .	. .	. .	X	X[28]	X	—	X	. .	X	X	X[28]	. .	. . .	—	X	—	43
—	—	—	—	—	X[32]	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	—	. .	—	—	—	. .	. . .	—	—	—	44
—	—	—	—	—	X	—	—	X	—	X	. . .	. .	. .	. .	X	—	—	—	—	. .	X	—	—	. .	. . .	—	—	—	45
—	—	—	—	—	—	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	—	. .	—	X	—	. .	. . .	—	X	—	46
—	X	—	—	—	—	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	X	. .	—	—	—	. .	. . .	—	—	—	47
—	X	—	—	—	X	X	—	X	—	X	. . .	. .	. .	. .	X	X	X	X[34]	—	. .	X	X	—	. .	. . .	—	—	—	48
—	—	X	—	—	X	—	X	—	(33)	—	. . .	. .	. .	. .	—	—	—	—	—	. .	—	X	—	. .	. . .	—	—	—	49
—	X	—	—	—	—	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	—	. .	—	—	—	. .	. . .	—	—	—	50
—	—	—	X	—	X	—	—	—	X	X	. . .	. .	. .	. .	X	—	—	—	—	. .	—	X	—	. .	. . .	—	—	—	51
—	—	—	X	—	X	—	—	X	—	—	. . .	. .	. .	. .	—	X[28]	—	X	—	. .	—	X	—	. .	. . .	—	—	—	52
—	—	—	—	—	X	—	—	—	—	—	. . .	. .	. .	. .	—	—	—	—	X	. .	—	—	—	. .	. . .	—	X	—	53

Ireland, statistics of the number of petitions are compiled.

[13] Items shown below are those which appear on the list report of divorces among the General population. The monthly list report of Muslim divorces includes the following items:

date of registration
divorce granted by whom?
divorce registration number
duration of marriage being dissolved
name of officiant [of divorce]
nature of divorce ("Talak" or "Fasah")
place of registration
race of divorcees

The list report of Kandyan divorces registered includes the following items:

date of registration
divorce registration number
duration of marriage being dissolved
grounds for divorce
place of registration
type of marriage ("Diga" or "Binna") being dissolved
which spouse requested divorce (petitioner)

[11] Civil registration of divorce is not compulsory for bulk of population, so compilation of statistics is not possible from registration sources. See also notes to Tables 1 and 2.

[15] Items shown below are those which appear on the individual report of divorces among European population, for whom registration is compulsory.

[16] Form was revised in 1952 with the addition of the item "religion" for divorcees.

[17] Identical individual statistical reports are received by the Central Bureau of Statistics from the prefects and from the courts. The items shown below are those which appear on these reports.

[18] No form available. Scottish Home Department publishes annually table of divorces from data supplied by Court of Session which gives number of divorces by duration of marriage and whether there were any children. Number of decrees is also published in the Registrar-General's report.

[19] Statistics of divorce are compiled in each state from records kept by the supreme courts. Items shown below are those which appear on the punch-card form used in New South Wales.

[20] Items shown below are those which appear on individual report of petitions for and decrees of divorce.

[21] Also, before or after consummation of marriage.

[22] Also date of preliminary *decree nisi*.

[23] Distinguishing only those registered in month of occurrence from those delayed.

[24] See also "Place of divorce registration"; where divorces are registered in place of occurrence, i.e., court, either item should give "Place of divorce (geographic)".

[25] See also "Place of divorce (geographic and/or court)"; where divorces are registered in place of occurrence, either item should give "Place of divorce registration".

[26] There are three types of divorces for Moslems in Egypt: (1) "ragi" (revocable), (2) "binona sogra" (termination of married life, resumption of which requires new contract with dowry), (3) "binona kobra" (final).

[27] Of wife only.

[28] Of husband only.

[29] Limited for certain countries as follows:
Honduras—under and over 12
Mexico, Nicaragua } under and over 14
Japan—"under age"
German Federal Republic—"minor"
Luxembourg, Netherlands } "under age"
Poland—under 7, 7-17
Portugal, Switzerland } "minors"

[30] For husband: number of wives divorced, number under protection, total.

For wife: number of previous husbands.

[31] For husband: number of wives at present under protection, divorced, total (including dead).

[32] Ethnic group.

[33] "Urban" or "rural" only.

[34] If different for husband and wife, since when?

CHAPTER IX

ITEMS ON STATISTICAL REPORTS OF VITAL EVENTS

In the previous chapter, there has been set forth a discussion of the statistical reporting procedure in the field of vital statistics and the general characteristics of statistical reports on vital events. This chapter will be devoted to the international recommendations on the content of the statistical reports of live birth, death, foetal death, marriage, and divorce, and to a detailed analysis of the reports used at the national level in 61 countries. The specific items included on each national report will be set forth, together with a survey of the degree to which these reports adhere to the international recommendations in matter of content.

A. Relationship to registers

It has been pointed out that the national statistical report for a live birth, death, stillbirth, marriage, and divorce might take the form of an individual-unit document or a multi-unit list report. In either case, the registrar is responsible for its completion, as well as for entering the vital event in the register. The question arises as to the relationship of these two documents — the register and the statistical report — especially in respect of content. Are the items of information on the statistical report those which appear in the register? Are statistical reports of live birth, death, stillbirth, marriage, and divorce limited by the same provisions as determine the content of legal registers? An analysis of the statistical forms for vital events in use in 1950 in 61 countries shows that there is no standard pattern.

Statistical reports which are *exact copies* of the registers are found in several countries, among which are Jordan and the Philippines, where an exact copy of the original certificate is prepared for statistical purposes; Brazil and Denmark, among others, where lists duplicating the registers are made; and in Canada and the United States where, for most areas, photographic copies of the original registration records are used.

Although an exact comparison of the individual registers and the statistical reports has not been made, a few countries report that the statistical report contains *less information* than is present on the original register. In the United States, those states not using microfilm use a standard "transcript" report which includes only those items required for national statistical purposes. Australia and Argentina, which like the United States of America, are confronted with the national standardization of data from a number of federated states, have adopted lists which require information on a standard group of items fewer in number than those available in the original registers. The *tarjeta* and the *boletín demográfico* of Chile also omit certain items of information recorded in the legal registers.

By far the largest group of countries prepare a separate and distinct statistical report which often contains items of information not found in the registers. The additional information required for these statistical reports may be obtained directly from the informant at the time the registration is made, as is done in Ceylon and in England and Wales among others. In these countries a draft entry is prepared to serve as a preliminary to the actual registration and also as a source of statistical data not required to be registered. In Poland also, the statistical report is required to be filled up first and the legal registration is made from it. In the Netherlands, the records of the population register may be used to complete the statistical report without troubling the informant with additional questions.

The trend toward statistical reports which contain items of information not in the register is prompted by a number of factors, one of which is the legislative restrictions which make changing the registers a laborious, lengthy, and sometimes impossible task. In some cases, reference in the registers to items of information such as race or legitimacy is forbidden by law, but these items can be asked for statistical purposes so long as the identity of the person involved is not disclosed. In such cases, a statistical report separate from the register solves the difficulty.

Another factor which may influence the trend toward independent and more extensive statistical reports on vital events is the practical difficulty of including in the established registers all the items of information considered necessary for statistical purposes. One example of this limitation may be cited. For purposes of establishing nationality, Ceylon has recently enacted legislation requiring in the registers of birth extensive information on "forefathers". To include, in addition, all the statistical items considered necessary would enlarge the register unduly.

B. Items included on statistical reports

It will be clear from the information set forth above that the items on the register do not wholly determine the contents of the statistical report except in a very few countries which employ a duplicate of the register for statistical purposes. Thus, from a strictly statistical viewpoint, the contents of the statistical reports of live birth, death, stillbirth, marriage, and divorce can be considered independent of the registers.

1. INTERNATIONAL RECOMMENDATION

Theoretically and practically, the items of information included on the statistical reports should reflect a detailed study of the desired tabulations and the ultimate uses to which the vital statistics will be put. In other words, the questions put to the informant should have their origin in the need for specific information of a statistical nature.

International recommendations must take cognizance of the fact that the statistical needs of a country may

differ from those of its neighbour and that the facilities for meeting these national needs may also vary. The recommendation of the United Nations in Principle 308[1] takes account of these factors by suggesting a "minimum" or basic list, together with additional items of second priority which might be desirable and practicable in various countries, depending on their national needs and resources. Principle 308, which includes the list of items suggested for the national statistical reports of live birth, death, stillbirth (foetal death), marriage, and divorce, is given below.

"308. *Content of the statistical report on a vital* event.

"(*a*) To satisfy national and international needs for vital statistics, the statistical reports of vital events for all countries should contain, as a minimum, a number of basic items and such additional items as may be desirable and practicable in each country.

"(*b*) A list of basic items for reports of live birth, death, foetal death, marriage, and divorce is given in paragraph (*d*) below. This suggested list is neither a minimum nor a maximum, but a desirable list of items. Each country should consider the scientific value of collecting information on other items which would permit additional analyses of demographic factors in relation to significant social and economic groups within the country. Items of this character which, because of their local rather than universal applicability, are not specified in list (*d*), might include 'ethnic group', 'country of birth', 'nationality', 'citizenship', 'religion', 'language', or additional information on economic characteristics.

"(*c*) The exact manner in which the specified items will be set forth on the statistical reports will be determined by each country, but the wording should be such that the results will conform to the definitions given in Principle 309.

"(*d*) Items suggested for each of five statistical reports are given below, arranged in alphabetical order by event and participants, with an indication of first (*) and second priority rating. Some countries at the early stages in the development of their vital statistics systems may wish to subdivide the first priority group in order to establish immediate and more advanced goals.

"(1) LIVE-BIRTH STATISTICAL REPORT ITEMS

"(i) *Characteristics of the event or child*
- *Attendant at birth
- *Date of occurrence
- *Date of registration
- Hospitalization
- *Legitimacy
- Period of gestation
- *Place of occurrence
- *Sex
- *Type of birth, i.e., single or plural issue
- Weight at birth

"(ii) *Characteristics of parents*
- Date of birth of father; if not available, age
- *Date of birth of mother; if not available, age
- Date of marriage (for legitimate births)
- Industry
- Literacy or level of formal education
- *Number of children born to this mother
- Occupation
- *Place of usual residence (of mother)
- Status (as employer, employee, etc.)

"(2) DEATH STATISTICAL REPORT ITEMS

"(i) *Characteristics of event*
- *Cause of death
- *Certifier
- *Date of occurrence
- *Date of registration
- *Place of occurrence

"(ii) *Characteristics of decedent*
- Age of surviving spouse (for married)
- *Date of birth; if not available, age
- Hospitalization
- Industry
- Legitimacy (for under one year of age)
- Literacy or level of formal education
- Marital status
- Number of children born (for females of child-bearing age or over)
- Occupation
- *Place of usual residence
- *Sex
- Status (as employer, employee, etc.)

"(3) FOETAL-DEATH STATISTICAL REPORT ITEMS

"(i) *Characteristics of event or product*
- Cause of foetal death
- Certifier or attendant
- *Date of occurrence (of foetal delivery)
- *Date of registration
- Hospitalization
- *Legitimacy
- *Period of gestation
- *Place of occurrence
- *Sex
- *Type of birth, i.e., single or plural issue
- Weight at delivery

"(ii) *Characteristics of parents*
- Date of birth of father; if not available, age
- *Date of birth of mother; if not available, age
- Date of marriage (for legitimate pregnancies)
- Industry
- Literacy or level of formal education
- *Number of children born to this mother
- Occupation
- *Place of usual residence (of mother)
- Status (as employer, employee, etc.)

[1] *Principles for a Vital Statistics System; Recommendations for the Improvement and Standardization of Vital Statistics.* United Nations. Statistical Office. Document ST/STAT/SER. M/19, 26 August 1953. p. 11-13. (Sales No. 1953.XVII.8)

"(4) MARRIAGE STATISTICAL REPORT ITEMS

"(i) *Characteristics of event*

*Date of occurrence
Date of registration
*Place of occurrence

"(ii) *Characteristics of bride and groom*

*Date of birth; if not available, age
Industry
Literacy or level of formal education
*Marital status
Number of previous marriages
Occupation
*Place of usual residence
Status (as employer, employee, etc.)

"(5) DIVORCE STATISTICAL REPORT ITEMS

"(i) *Characteristics of event*

*Date of occurrence
Date of registration
*Place of occurrence

"(ii) *Characteristics of divorcees*

*Date of birth; if not available, age
*Date of marriage
Industry
Literacy or level of formal education
*Number of dependent children
Number of previous marriages
Occupation
Place of occurrence of marriage
*Place of usual residence
Status (as employer, employee, etc.)."

It should be emphasized that the United Nations recommendation has two aspects — a first-priority list of items which, it is suggested, should be collected by all countries, and a second-priority group of items which may constitute a longer range goal, depending on national conditions and needs. In addition to these two groups, paragraph (*b*) of the Principle suggests that a third group of items may need to be considered for collection by each country, namely, the type of item which has purely national significance rather than universal applicability such as "race", "ethnic characteristics", "language", and so forth. Thus, the international recommendation places no limitation on the potential contents of statistical reports.

It will be seen at once that the first-priority list is a relatively short and simple one for each type of event, amounting to no more than 10 items for live births, eight for deaths, 10 for foetal deaths, five for marriages, and six for divorces. Moreover, these priority items are those which can be defined rather specifically and therefore offer the fewest difficulties of collection.

With these basic items, a minimum set of tabulations can be made which will be useful to both demographic and public-health services. The remaining items provide material for a more advanced tabulation programme which virtually covers the more ordinary needs of any national office of vital statistics. Each of the items in the list, whether a basic item (marked with an asterisk) or one in the secondary category (unmarked), has been included because tabulations on that item are considered necessary for the full utilization of vital statistics in the various consumer fields. From this viewpoint, the sum total of items may be considered as the standard contents of vital-statistics reports, based on desirability of tabulations. The uses to which each item might be placed advantageously and the difficulties which might be encountered in obtaining the data will be discussed in chapter X in connexion with the recommended definitions and classifications.

International standardization of the *type* (form) of the statistical report has been mentioned previously. The advantages to be gained by standardizing *content* are very much greater, so long as this standardization is not restrictive. An arbitrary arrangement of items of information on a form of determined size and shape can be restrictive, because it does not take account of the possible need to add other items of national interest or to arrange the required items in another pattern more conducive to efficient transcription and filing. The United Nations list of first- and second-priority statistical items standardizes content in so far as it constitutes a recommendation on the information desired, but it leaves complete freedom for a country to add to the list any other item of national interest, and it allows these interests to determine the arrangement of items which for that country is most efficient.

The recommendation in Principle 308 suggests neither an arbitrary size, shape, or format for statistical reports, nor the total number of items which should be included. It does not specify the manner in which the recommended items might be obtained, that is, the manner in which questions should be phrased to elicit the desired information. It recommends only that such wording as is adopted by the various countries should conform in so far as possible with the meaning of the corresponding definitions set forth in Principle 309 and discussed in chapter X.

The advantages of a basic recommendation for the content of statistical reports on vital events cannot be over-emphasized. From the national viewpoint, it gives some guidance toward the goal of full utilization of vital statistics. From the international viewpoint, it helps to provide comparable data for a number of countries, the study of which will be of benefit to all countries. Because of the important needs the recommended collection programme will meet, the goal of the international vital-statistics programme should be to foster the inclusion of the recommended items on the vital-statistics reports of all countries.

2. NATIONAL PRACTICE

Because statistical reports may be duplicates, abstracts, or extensions of data found in the registration record and since it has been shown that the registration records in every country contain approximately the same types of data, it may be expected that most countries will require at least a nucleus of statistical information which is similar to that required by the other countries. In order to determine the similarity or dissimilarity of the items of information collected by the various countries and to see how closely these collection programmes adhere to the international recommendation, a study was made of the statistical reports of live birth, death, stillbirth, marriage, and divorce in use on 1 January 1950 in the 65 countries under study. Appropriate statistical forms for four countries were not available for any of the five events. Reports for certain events for some other countries were either lacking or not applicable, with the result that the live-birth, death, stillbirth, marriage, and divorce reports

available for study numbered 60, 61, 57, 56, and 40 respectively. The individual items collected in these reports are shown in tables 13-17, to be found in pocket at the end of the volume.

For convenience, the items in tables 13-17 have been classified according to the categories employed in the United Nations recommended list. Within each category, the items are arranged alphabetically for ease of reference. The countries, as in all other tables, are arranged in alphabetic order according to continent.

It should be noted that these tables present the items available at the *national* level, that is, those upon which national tabulations could be made. The limitation of the analysis to forms from which vital statistics are compiled at the national level is an important one. It means that for the nine countries which have a decentralized system of compilation for any of the five vital events, the items shown in tables 13-17 will be few, because they are only those which are included in the standard *tables* or *summaries* prepared at a subnational level for subsequent consolidation into national vital statistics. From the viewpoint of content alone, the limitations of such reports will be obvious.

It should be emphasized that tables 13-17 do not reproduce the exact form of the question on each item, but only its intent. This is so because the manner of phrasing the question designed to elicit information on a selected item depends largely on national or regional factors and customs. It depends also on the amount of information desired for national purposes. Thus, questions on "hospitalization" may be phrased to require the name or address of the institution in one country, while they may be answered simply "yes" or "no" in others. The distinction will not be obvious from tables 13-17. Likewise, the degree of detail required for the answers to the questions on age, i.e., year, month, day, hour, minute, cannot be ascertained from these tables. What can be deduced from tables 13-17 is that a question on a certain item of information has been included on the statistical form.

(a) *Number of items per country*

The extent and complexity of the stubs in tables 13 to 17 reveal at once the tremendous amount of demographic and public-health data being collected in different parts of the world. The lists of items represent a potential wealth of data, some of it indeed for only one or two countries, but which collectively would seem to answer any conceivable question in the vital-statistics field. The stub of table 13 contains 55 major items, as well as a number of sub-items; the 61 statistical reports of death in table 14 together contain 52 important separate items plus, in this case, a relatively large number of subsidiary items especially concerned with cause of death. The 57 stillbirth statistical reports in table 15 contain a maximum of 60 items but, because the live-birth and/or the death statistical report is used for stillbirth reporting in some countries, some of these 60 items are not relevant. The 56 marriage statistical reports in table 16 contain 58 different items, and the 40 divorce reports in table 17 cover 42.

It will be noted, however, that the reports for any one country do not include all or even nearly all the items shown. Among the live-birth reports, the items per country may vary from four for Lebanon to 34 for Israel. The minimum and maximum number of items found on each type of report is given below, together with the number in the United Nations first- and second-priority groups:

Statistical reports of	*Number items per country*			*Number recommended by United Nations*	
	Minimum	*Median*	*Maximum*	*First priority*	*First plus second priority*
Live birth	4	19-20	34	10	19
Death	4	16	27	8	17
Stillbirth (foetal death)	3	18-19	44	10	20
Marriage	2	18-19	31	5	11
Divorce	2	12	23	6	13

The tabulation above shows first that there is a wide range among countries in the number of items collected at the national level for vital statistics. The countries which have the minimum number are those which collect national statistics not by individual statistical reports, but by means of tabular summaries. Those with the maximum number are not easily classified, including as they do Israel, the Netherlands, Bolivia, Greece, and Czechoslovakia.

Except for the marriage report, the median number of items collected by the countries falls close to the full list suggested by the United Nations. In other words, 50 per cent of the countries are already collecting a total number of items of information almost equal to the sum of the first- and second-priority lists suggested by the United Nations. Further, only seven of the 60 countries fail to collect at least 10 items on the statistical report for live births. Thus, it may be said that almost 90 per cent of the countries already collect as many live-birth items as are suggested on the first-priority United Nations list; for the death statistical report, the percentage is 93; for stillbirth, 84 per cent; for marriages, 96 per cent; and for divorces, 87 per cent. In so far as the gross number of items is concerned, it is clear that most countries have already exceeded the recommended minimum, and half have almost equalled the second-priority recommendation. The United Nations recommendation is, therefore, well within the limits of present practice in so far as number of items per country is concerned.

(b) *Number of countries per item*

Although the number of items collected by countries may exceed the United Nations recommended number for each type of report, the types of information collected may be completely different. In order to study this aspect of the country-collection programmes, information from tables 13-17 has been condensed so that the major items on each type of report could be arranged in rank order according to the number of countries collecting each. The items have further been identified as belonging either to the United Nations first-priority group (**) or to the second-priority category (*).

Live-birth report items. In the tabulation below, items on the live-birth reports are arranged in rank order of the number of countries collecting each. Reports of 60 countries shown in table 13 have been included. The items shown are the 55 major items, omitting the finer detail shown in table 13 for legitimacy, number of children born, and so forth.

Items on statistical reports of live birth	*Number of countries collecting*
**Sex of infant	60
**Date of birth of infant	54
Place of registration of birth	51†
**Legitimacy	50
**Date of birth of mother, or age	50
**Date of registration of birth	48
Birth registration number of infant	46
**Type of birth	46
*Occupation of father	45
**Place of birth (geographic) of infant	43†
*Date of birth of father, or age	41
**Number of children born to mother	41
*Occupation of mother	37
**Place of residence of mother	36
Name of infant	34
*Hospitalization	30
Citizenship of father	28
Citizenship of mother	28
Stillborn or liveborn?	27
**Attendant at birth	24
Name of mother	23
Name of father	22
Place of residence of father	22
*Date of marriage of mother	20
Place of birth of mother	20
Place of birth of father	19
*Industry of father	16
Religion of father	15
*Industry of mother	14
Religion of mother	14
*Status (employer, employee, etc.) of father	13
*Status (employer, employee, etc.) of mother	12
Race or colour of father	8
Race or colour of mother	8
Citizenship of infant	8
Religion of infant	8
*Period of gestation	7
Origin of mother	6
*Literacy of mother	5
Duration of marriage of mother	5
Race or colour of infant	5
*Literacy of father	5
Origin of father	5
Is infant premature or full term?	4
*Weight of infant at birth	4
Date of baptism of infant	3
Health condition of infant	3
Language spoken and/or mother tongue of mother	3
Language spoken and/or mother tongue of father	3
Birth registration number of father	2
Birth registration number of mother	2
Delivery normal or otherwise?	2
Length of infant at birth	1
Duration of hospitalization of mother	1
Health condition of mother	1

† Incomplete because of the fact that where events are registrable in the place where they occurred, "place of registration" and "place of occurrence" give the same information, and they are sometimes used interchangeably.

It will be immediately evident that, with only two or three exceptions, the two-starred or first-priority items are concentrated at the top of the order — that is they are items which most countries include in one form or another on their statistical reports of live birth. The only item with 100 per cent representation is sex. Following this universally collected particular of information are date of birth, legitimacy, date of birth of mother, date of registration, type of birth, place of birth (geographic), number of children, and place of residence of mother — all of which are collected by 60 per cent or more of the countries. In addition to these first-priority items, three of the second priority, i.e., occupation of mother and of father and date of birth of father, fall in this same group.

The only first-priority item which is not so widely collected is "attendant", which is found on the live-birth report of 24 of the 60 countries. The remaining items recommended as second priority by the United Nations are scattered throughout the order from hospitalization collected by 30 countries to weight of infant collected by four. The use of the latter item in determining prematurity will no doubt lead to its increased inclusion when reports are revised. Likewise, period of gestation — now collected by only seven countries — will perhaps receive more attention in the future. Information on literacy of the parents, their industry and status, was — in 1950 — collected by relatively few countries, but the importance being attached to interrelating social, demographic, and economic factors may tend to promote wider collection.

Death report items. The number of countries collecting each of the items on the death statistical reports for 61 countries is as follows:

Items on statistical reports of death	*Number of countries collecting*
**Sex of decedent	61
**Date of birth of decedent, or age	60
**Cause of death	57
*Marital status	54
Place of death registration	53†
**Date of death	52
*Occupation of decedent	49
**Date of death registration	48
Death registration number	46
**Place of death (geographic)	44†
**Place of residence of decedent	44
Name of decedent	39
**Certifier of cause of death	36
Citizenship of decedent	33
*Hospitalization	31
Medical attendance during last illness	31
*Legitimacy of decedent (if under one year)	30
Place of birth of decedent	29
*Industry of decedent	22
Religion of decedent	17
Occupation of mother and/or father	15
Race or colour of decedent	14
Name of mother and/or father	12
*Status (employer, employee, etc.) of decedent	12
*Number of children born to the decedent	11
*Date of birth of surviving spouse, or age	11
Duration of stay in place of death	10
Date of marriage of decedent	9
Stillbirth or death?	7
Origin of decedent	6
Place of birth of mother and/or father	6
Diet of infant [decedent]	6
Birth registration number of decedent	5
Age of mother and/or father	5
Industry of mother and/or father	5
Birth order of decedent (if infant)	4
Duration of marriage of decedent	4
Identification number of decedent	4
*Literacy of decedent	4
Social security number of decedent	3
Place of birth registration of decedent	3
Age of decedent at marriage	2
Date of birth of mother	2
Status (employer, employee, etc.) of mother and/or father	2

Was decedent premature or full term?	2
Were mother and/or father of decedent alive at death of decedent?	2
Citizenship of mother and/or father	2
Language of decedent	1
Place of marriage of decedent	1
Place of marriage registration of decedent	1
Weight and length of decedent at birth	1
Race or colour of mother and/or father	1

† Incomplete because of the fact that where events are registrable in the place where they occurred, "place of registration" and "place of occurrence" give the same information, and they are sometimes used interchangeably.

Sex again is the universally collected item, followed by date of birth and cause of death — all three first-priority United Nations recommendations. The concentration of United Nations recommended items at the top of the order is as striking as it was in the live-birth report, all first-priority items being required by 36 or more of the 61 countries. Of the second-priority United Nations items, literacy alone is low in the scale, being collected by only four countries.

Stillbirth report items. The rank-order analysis of items collected on stillbirth statistical reports is made difficult by the fact that, in 29 countries, either the live-birth or the death report or both are used for reporting stillbirths. The result of this lack of specificity in the statistical report form is to introduce many items not relevant to the foetus, such as literacy, marital status, citizenship, occupation, religion, and so forth. Because of this, 11 irrelevant items have been deleted from the rank order shown below:

Items on statistical reports of stillbirth	*Number of countries collecting*
**Sex of foetus	57
**Date of delivery	49
Place of registration	48†
**Legitimacy	47
**Date of birth of mother, or age	45
**Type of birth	43
**Date of registration	42
Registration number	40
**Place of delivery (geographic)	37†
*Occupation of father	37
**Place of residence of mother	36
**Number of children born to mother	36
*Hospitalization	35
*Certifier or attendant	35
*Occupation of mother	34
*Date of birth of father, or age	32
*Cause of stillbirth (foetal death)	31
Stillbirth, live birth, or death?	27
Name of mother	26
Name of foetus	24
Citizenship of mother	24
**Period of gestation	23
Name of father	23
Citizenship of father	20
Place of residence of father	17
Place of birth of mother	17
*Industry of mother	16
*Date of marriage of mother	16
Time of death (before, during, after labour, etc.)	15
*Industry of father	15
Place of birth of father	14
Race or colour of mother	11
Religion of mother	11
Religion of father	11
*Status (employer, employee, etc.) of mother	10
*Status (employer, employee, etc.) of father	10
Race or colour of father	9
Duration of marriage of mother	5
Origin of mother	5
Origin of father	5
*Weight of foetus at delivery	3
*Literacy of mother	3
*Literacy of father	3
Birth registration number of mother	2
Birth registration number of father	2
Is foetus premature or full term?	2
Length of foetus at delivery	1
Language of mother	1
Language of father	1

† Incomplete because of the fact that where events are registrable in the place where they occurred, "place of registration" and "place of occurrence" give the same information, and they are sometimes used interchangeably.

The statistical reports of 57 countries have been considered in preparing this tabulation. As in the case of the live-birth and death reports, the United Nations recommended items are those collected by most countries, i.e., sex, date of delivery, legitimacy, date of birth of mother, type of birth, date of registration, place of delivery, place of mother's residence, and number of children born. These nine items are being collected by 36 or more of the 57 countries. Period of gestation, although a first-priority item in the *Principles*, is collected by only half of the 57 countries, perhaps reflecting the fact that emphasis on the need for its inclusion has had a short history. Except for occupation, the socio-economic items in respect of stillbirths are not yet collected by the majority of countries. Occupation of the father has a high frequency of occurrence, being collected by 37 out of 57 countries, while occupation of mother is collected by 34. But industry of mother and of father, religion of parents, status, and literacy are collected by few countries.

Marriage report items. Marriage statistical reports are available for 56 countries. In the tabulation which follows, a total of 58 major items which appear on these 56 reports are arranged in rank order by number of countries collecting:

Items on statistical reports of marriage	*Number of countries collecting*
**Date of birth of bride, or age	54
**Date of birth of groom, or age	54
**Marital status of bride	52
**Marital status of groom	52
Place of marriage registration	49†
*Occupation of groom	46
Marriage registration number	44
**Date of marriage	43
*Date of marriage registration	42
*Occupation of bride	41
Citizenship of bride	37
Citizenship of groom	37
**Place of residence of groom	35
**Place of residence of bride	33
Name of groom	28
Name of bride	27
**Place of marriage	27†
Place of birth of bride	24
Place of birth of groom	24
Religion of bride	19
Religion of groom	19
*Literacy of groom	19
*Number of previous marriages of bride	18
*Number of previous marriages of groom	18
*Literacy or level of formal education of bride	18

Type of marriage (civil, religious, customary)	14
Number of children (of bride) legitimized by this marriage	13
*Status (employer, employee, etc.) of bride	13
*Status (employer, employee, etc.) of groom	13
Officiant of marriage	12
*Industry of groom	10
*Industry of bride	9
Relationship of bride to groom	9
Relationship of groom to bride	9
Race or colour of bride	8
Race or colour of groom	8
Names of fathers of participants	8
Occupation of fathers of participants	8
Number of children of previous marriages of bride	7
Number of children of previous marriages of groom	7
Date of dissolution of last marriage of bride	6
Date of dissolution of last marriage of groom	6
Origin of bride	5
Origin of groom	5
Names of mothers of participants	4
Identification number of bride	3
Identification number of groom	3
Language spoken and/or mother tongue of bride	3
Language spoken and/or mother tongue of groom	3
Occupations of mothers of participants	2
Places of birth of fathers of participants	2
Places of birth of mothers of participants	2
Legitimacy of bride	1
Legitimacy of groom	1
Citizenship of fathers of participants	1
Citizenship of mothers of participants	1
Places of residence of fathers of participants	1
Place of residence of mothers of participants	1

† Incomplete because of the fact that where events are registrable in the place where they occurred, "place of registration" and "place of occurrence" give the same information, and they are sometimes used interchangeably.

Although the first-priority United Nations items, date of birth and marital status of participants, are again at the top of the order, no one item is collected by all 56 countries. Other first-priority items, i.e., date of marriage, place of residence, and place of marriage, are among those collected by 50 per cent or more of the countries. Again, the socio-economic items of second-priority interest are collected by a third or fewer of the 56 countries.

Although the relationship between "place of occurrence of the event" and "place of registration" is a factor in the frequency with which the two items appear on the live-birth, death, and stillbirth statistical reports (see † above), it is much more important in connexion with marriage reports. Since marriages are registrable at the place of marriage in many countries, the two items yield essentially the same information, and this is probably the reason why only 27 countries require "place of marriage" on their reports, while 49 ask for "place of marriage registration." Close relationship exists also between the concepts of "place of marriage" and "place of residence of bride or groom," because national law often prescribes "place of residence" as the place where the marriage may take place. There is a similar connexion between "date of marriage" and "date of marriage registration", because in many countries marriages must be registered at the time of the ceremony (see table 9).

These interrelationships between "place" and "date" items affect the recorded frequency as set forth in the list above, and a more detailed study of the underlying factors should be made before conclusions are drawn.

Divorce report items. Because divorce in the sense of final marriage dissolution does not exist in nine countries, and because for several others statistical reports are not available, there are only 40 countries represented in the analysis presented in the tabulation below:

Items on statistical reports of divorce	*Number of countries collecting*
**Number of children of divorcees	32
**Date of divorce or final court decision	31
**Date of birth of divorcees, or age	31
Grounds for divorce	30
*Occupation of divorcees	28
**Place of divorce (geographic and/or court)	28†
Registration number	26
*Date of divorce registration	24
**Date of marriage being dissolved	23
Party who requested divorce (petitioner)	22
Place of divorce registration	20†
**Place of residence of divorcees (at time of divorce)	19
Citizenship of divorcees	19
Religion of divorcees	14
Names of divorcees	13
Duration of marriage being dissolved	12
Place of birth of divorcees	9
Date of petition	9
*Literacy or level of formal education of divorcees	9
Number of previous divorces of divorcees	8
*Place of marriage (geographic) being dissolved	8
Marital status of divorcees prior to the marriage	7
Party found guilty	6
*Status (employer, employee, etc.) of divorcees	6
Type of divorce (mutual consent, other)	6
Separation prior to divorce	6
Date of marriage registration	5
*Industry of divorcees	5
*Number of previous marriages of divorcees	5
Place of residence (last common) of divorcees	4
Party to whom divorce granted	4
Race or colour of divorcees	4
Type of marriage (civil, religious, customary)	4
Marriage registration number	3
Alimony	3
Place of marriage registration	3
Fees paid	2
Age of divorcees at time of marriage	2
Identification numbers of divorcees	2
Legitimacy of divorcees	2
Origin of divorcees	2
Language spoken and/or mother tongue of divorcees	1

† Incomplete because of the fact that where events are registrable in the place where they occurred, "place of registration" and "place of occurrence" give the same information, and they are sometimes used interchangeably.

The first point of interest is that no one item is collected by all countries and, as a matter of fact, the most common item — number of children of the divorcees — is collected by only 32 countries. Following this are the other United Nations first-priority items, namely, date of divorce, date of birth of divorcees, place of divorce, date of last marriage, and place of residence, the last being collected by 19 or just under one half of the 40 countries. The general order of the remaining items is similar to their location in the rank order of live-birth, death, and marriage statistical items. The reservations made above in connexion with the "place" and "date" items on the marriage statistical report are equally applicable to the divorce statistical report.

CHAPTER X

ITEMS ON STATISTICAL REPORTS: USES, DEFINITIONS, CLASSIFICATIONS, AND PROBLEMS RELATING TO

Chapter IX was devoted to a discussion of the items of information recommended for collection on the statistical reports of live birth, death, foetal death, marriage, and divorce. This chapter supplements chapter IX with a justification for the inclusion of each item in terms of its utility in vital-statistics analysis, with a definition and a classification scheme recommended for each item, and a description of the special problems which may be encountered in obtaining the desired information in the suggested form.

It is axiomatic that each item on the vital-statistics reports must be accompanied by a clear definition which will allow the registrar to obtain the information required for statistical purposes. So important is the matter of definitions that the United Nations, in drawing up the *Principles for a Vital Statistics System,*[1] included one specifically designed to emphasize this need. The Principle is as follows:

"309. *Definition of each item on the statistical report*

"(*a*) Each item on the statistical report should be accompanied by a clear, explicit, and simple definition for the guidance of the person recording the information.

"(*b*) In order to achieve international comparability, definitions adopted should be in accordance with established international standards and, in so far as possible, with current population census practice in each country . . ."

It will be noted that the Principle emphasizes first the provision of a definition, followed by a recommendation that these definitions should be in accord with established international standards, if such exist, and in any case with current population census practice. This latter point is particularly important, because of the fact that the computation of vital-statistics rates depends on relating vital-statistics frequencies to population. Unless characteristics of the two are similarly defined, the resulting rates will be difficult to evaluate. The points at which correspondence should be established will be pointed out in connexion with each definition given below.

It is hardly feasible or necessary to examine and comment on every item of information contained in all of the statistical reports examined. In order to confine the task to practicable limits, the discussion will be limited to the items suggested by the United Nations for inclusion in such reports, together with the few additional items listed in Principle 308 as of an optional character dependent on national needs.

[1] *Principles for a Vital Statistics System; Recommendations for the Improvement and Standardization of Vital Statistics.* United Nations. Statistical Office. Document ST/STAT/SER. M/19, 26 August 1953. p. 13. (Sales No. 1953.XVII.8)

In the paragraphs that follow, each item—irrespective of its applicability to more than one type of statistical report—will be dealt with only once. The appropriateness of this consolidated discussion will be apparent from a review of the items shown in tables 13-17. All of the items on each table fall naturally into several types. One type of item is that concerned with the *nature of the event* itself and its registration. In this group, place of occurrence, date of occurrence, place and date of registration, and so forth, are common to all events. The second group is comprised of *characteristics of the persons* involved, as for example, attributes of the parents, the deceased, the bride and groom, or the divorcees, and includes such items as age, occupation, literacy, number of children born, and so forth. Irrespective of the person or event to which they refer, items in both groups are defined in the same way, and a single discussion can suffice to elucidate the problems of collection and their effect on statistics of live birth, death, foetal death, marriage, and divorce.

The discussion will be divided into the following parts: (*a*) the uses of the particular data, (*b*) the international recommendations for their definition, form of collection and classification, and (*c*) the problems encountered in obtaining the data. For convenience, the items are presented in alphabetical order.

Age

USES OF DATA

Information on the age of the persons concerned with a vital event is essential for analytical purposes. Tabulations of live births by age of mother or of father, alone or in conjunction with birth order, legitimacy, occupation, and so forth, may reveal patterns of natality fundamental to a study of fertility, as well as socio-economic differentials obtainable in no other way. They also serve as the basis for the computation of replacement rates which are fundamental to demographic research.

Age at death, alone or cross-classified by some other characteristic such as cause of death or occupation, is basic to the entire public-health programme. It is also fundamental to the construction of life tables and net reproduction rates, the importance of which cannot be over-estimated.

The age at which persons marry is information which has a bearing on future fertility patterns and on the eventual population structure of a country. In the case of deaths of married persons, the age of the surviving spouse may be used to evaluate some of the socio-economic implications of widowhood and to give a crude indication of the age structure of married couples for computation of population estimates. The age of divorcees has a similar application in evaluating the

demographic potentialities of a population as well as family stability. It is not too much to say that almost every characteristic by which vital data may be classified becomes more meaningful if cross-classified by age.

International recommendations

Age, or at least the dates necessary for its computation, is given first priority among the items recommended for collection on statistical reports of vital events. The Statistical Commission of the United Nations[2] has also defined age for purposes of vital statistics. The suggested definition, which is in accordance with standard practice in population censuses and with that recommended by the Population Commission,[3] is as follows:

> "Age (duration of life at death, at birth of child, at delivery of foetus, at marriage, at divorce) is the estimated or calculated interval between the date of birth and the date of occurrence of the event, expressed in the largest possible completed units of time, such as years, months, weeks, days or hours of life, as appropriate."

In this recommended definition, age is defined as age at last birthday, expressed in the largest possible completed units of time. However, it will be noted that the emphasis is upon "dates" — date of birth, date of death, date of delivery of foetus, date of marriage, date of divorce — implying that the question to appear on the statistical report should be the indirect one on date rather than the direct one on age. In fact, the United Nations recommended list of items for statistical reports gives age, as such, a secondary or substitute place, the desired item of information being date of birth.

The classification schemes suggested by the United Nations[4] for use in the recommended tabulation programme have one characteristic in common—ages above one are grouped into five- or ten-year age classes beginning with zero or five. This is the traditional method of grouping ages into mutually exclusive equal age groups, which has the advantage of almost universal acceptance.[5]

Age of mother. In connexion with statistics of live births, a classification is proposed beginning with under 15 years, continuing in five-year age groups through 15-19 and so forth to 45-49, and ending with 50 and over and not stated. This is the classification which has been found most consistently among the vital statistics of many countries as shown in the United Nations *Demographic Yearbook*.[6] It is also one which usually corresponds to the population data presumably available for rate computation. Thus, this classification may be accepted as a standard.

Age of father. For statistics of live births by age of father, no international standard has been proposed, but any classification of this attribute should also be in accord with the age classification used for the census of population. The classification to be chosen might follow the pattern of that recommended for age-of-mother tabulations, with perhaps a lower limit of 20 years instead of 15, to take account of the older age at which males usually marry, and with an extension to an age older than 50 to take account of the longer duration of procreative ability in the male. Such an age classification of fathers, minus the upper age-range extension, was used in the *Demographic Yearbook*[7] to set forth live births by age of father.

Age at death. For general mortality statistics, the standard classification proposed begins with an under-one-year group and proceeds in single years to four, thence in five-year age groups to 84, with two terminal groups of 85 and over and not stated. Essentially the same classification was proposed for census data in "Tabulations of Data from Population Censuses to be Taken in or about 1950".[8] It was also recommended in article 6 (*a*) of the World Health Organization Regulations No. 1[9] for use in tabulating cause of death by sex and age. A detailed age classification such as this is considered essential for any age-sex-cause distribution of death statistics for the country as a whole and for all distributions in which age and sex alone are cross-classified.

Tabulations by age for subnational areas should also use this "5-year" age classification unless a third variable such as cause of death or occupation is introduced. With three variables, such detail is hardly practicable. Consequently, for subnational tabulations, the five-year age groups are often consolidated into 10-year groups beginning with five and ending with 74. Such a classification scheme is recommended by the United Nations for tabulation of deaths by age, sex, and cause in major civil divisions and cities.[10] It will be noted that this consolidation of age groups is also in accordance with the recommendations of the World Health Organization for statistics of cause of death by age and sex in large cities, urban-rural areas, and administrative sub-divisions.[11]

Infant mortality. Statistics on infant mortality by age should be detailed enough to reveal mortality con-

[2] *Ibid.* p. 13.

[3] *Official Records of the Economic and Social Council, 7th Session. Supplement No. 7* (E/805), annex A, part II, p. 14.

[4] *Principles for a Vital Statistics System, op. cit.* p. 20-23.

[5] Other groupings have been considered from time to time. On the assumption that some of the ages reported as ending in 0 and 5 should actually be the ages ending in 9, 1, 4, or 6, the grouping of ages into five-year groups beginning with 0 or 5 might tend to overstate the true age frequencies by including in an upper class ages which should if correctly reported be included in the next lower interval. One method which has been suggested to avoid this bias is to design the five-year groups in such a way that an age ending in 0 or 5 becomes the central age in the group. In this way, the two ages adjacent to the preferred ones would be included in the same 5-year groups and, thus, the groups would be more likely to comprise all of the frequencies which belong there. An obvious disadvantage is, of course, the unfamiliar outline of this classification and the fact that the initial class interval is of different length from the remaining intervals. The usual quinquennial and decennial groupings are so well established that it is unlikely that they will be replaced either in the population census or in the vital-statistics tabulations.

[6] *Demographic Yearbook.* United Nations. Statistical Office. 6th issue, 1954. Table 10. (Sales No. 1954.XIII.5)

[7] *Ibid.* Table 14.

[8] *Official Records of the Economic and Social Council, 9th Session, Supplement No. 7* (E/1313), annex 2. p. 17.

[9] World Health Organization, *Official Records,* No. 13, p. 350.

[10] *Principles for a Vital Statistics System, op. cit.* p. 21.

[11] World Health Organization, *Official Records,* No. 13, p. 350.

centrated in the first few days of life, as well as neonatal (first-month-of-life) mortality.

The age classification recommended for this purpose by the United Nations Statistical Commission[12] is a detailed one, specifying single days of life through the first week, 7-13 days, 14-20 days, 21-27 days, 28 days to under two months; single months through 11, and not stated. This classification, which provides the information required for a detailed analysis of infant mortality by age, is also that recommended by the World Health Organization for special statistics of infant mortality by age.[13]

The great variation among nations in the distribution of infant deaths over the first year of life, and the greater effectiveness of most public-health measures to decrease mortality first in the older months of the range, makes it desirable that the age distribution of deaths during the first year be carefully and accurately set forth. Problems of under-registration are, of course, very important in this age range, but in spite of these handicaps, statistics of infant mortality by detailed age reveal very distinctly the public-health problems to be overcome. High rates of infant mortality in the upper-age range are almost surely due to lack of public-health measures such as adequate sanitation, nutrition, and so forth. Classification by cause would likely reveal that deaths occurring from five to 11 months are due primarily to diarrhoea and other infant diseases of this type. Deaths at the early infant ages are, on the other hand, due in large part to prematurity, congenital debility, and other causes related to inter-uterine life and to the type of pre-natal and immediate post-natal care. To decrease mortality in this range requires measures different from those which are effective in decreasing the infectious diseases which claim infant lives at the later months of life. The importance of clearly defined and accurately reported infant deaths, therefore, is evident, and the need for a standard age classification in completed days, weeks, and months of age becomes fundamental.

Age at marriage and divorce. The recommended age distribution of marriages and of divorces follows closely that suggested for deaths, except for its initial and terminal groups which, for obvious reasons, need not be so detailed. The classification begins with a category of under 15 years, proceeds in five-year age groups to 74, and terminates with 75 and over and not stated. This classification, being similar to that for deaths, is also in accordance with the classification recommended by the Population Commission of the United Nations[14] for "Tabulations of Data from Population Censuses to be Taken in or about 1950".

Problems of obtaining data

The problem of eliciting correct information on age is one common to any statistical investigation which deals with human beings.[15] Study of the vital-statistics forms reveals that they, like the population census schedules, use two types of questions to obtain this information. One of these is the direct question phrased in terms of age at last birthday or, more simply, age undefined. The other method is the indirect one of requesting a date from which age at any given moment can be calculated.

Direct question. Answers to the direct question give a report on age which may or may not be correct but which, unless accompanied by a supplementary date-of-birth question, is final. It is not subject to verification except by querying or re-questioning. Its accuracy may be influenced by many factors, one of which is the well-known tendency on the part of respondents to prefer ages ending in zero, two, five, and eight.[16] This tendency to prefer ages ending in certain digits is further aggravated by the fact that much of the information on the reports of live birth and death may be given by an informant who does not necessarily know the exact age of the individuals involved.

Substitution of approximations for exact knowledge is common in supplying information on age but, on the other hand, wilful misstatements, brought about by a desire to understate or overstate age, are not found to any great extent in vital statistics. This is so probably because there is little to gain by falsifying these facts and because the possibility of cross-checking to other legal documents is recognized by the informant. Nevertheless, cases are not unknown where age at death and age of surviving spouse have been falsified for insurance purposes.

The advantage of a simple direct question on age is, of course, the fact that some answer or estimate can always be elicited, thus reducing — even if only by estimation — the unknown-age category in the frequency distribution.

Indirect question. The indirect approach to securing age information, that is, the employment of a question on date of birth, date of marriage, date of death, and so forth from which it is anticipated correct age can be calculated, tends to elicit more adequate information, which will permit uniform calculation of age with respect to any subsequent event.

The formulation of the indirect question for determining age presents no difficulties in respect of a live birth, a death, or a marriage but, in the case of divorce, "date of marriage" or "date of divorce" must always be clarified to identify it with current, previous, or first marriage or divorce, as desired. Because of the increase in error when data have to be recalled from memory, information relating to the current marriage or recent divorce would produce the more accurate response.

Despite its ability under good circumstances to elicit more accurate and useful data than the direct question, the indirect date question is not free from disadvantages. Foremost among its drawbacks is the inability of illiterate and backward peoples to give any information on dates, while they could perhaps give an estimate of age. Secondly, it must be remembered that the in-

[12] *Principles for a Vital Statistics System, op. cit.* p. 21.

[13] World Health Organization, *Official Records,* No. 13, p. 350.

[14] *Official Records of the Economic and Social Council, 9th Session, Supplement No. 7* (E/1313), annex 2. p. 17.

[15] For a detailed discussion of these problems in population censuses, see *Population Census Methods.* United Nations. Statistical Office and Department of Social Affairs, Population Division. Document ST/SOA/Series A, No. 4, November 1949. p. 14. (Sales No. 1949.XIII.4)

[16] *United States Life Tables and Actuarial Tables 1939-1941,* by Thomas N. E. Greville. Department of Commerce. Bureau of the Census. Gov. Print. Off., Washington, 1946. Also, "Errors and Bias in the Reporting of Ages in Census Data", by Robert J. Myers. *Transactions, Actuarial Society of America,* Vol. 41, part 2, No. 104, October-November 1940.

formant may not be able to give accurately the dates which refer to other persons.

Attendant at birth

Uses of data

The degree to which deliveries are attended by physicians, nurses, or midwives is one indication of the level of public-health and medical progress in an area. Tabulating live births by type of attendant will also yield information of potential sociological significance — especially if the item is further cross-classified by legitimacy and hospitalization, for example. Together, these types of data might show the extent to which medical-care facilities are being used by various segments of the population and also where additional services may be required.

From the strictly public-health viewpoint, this item has still another use. It is a well-known fact that the mother and child who have medical or nursing attendance before, during, and after the delivery have a better chance of surviving than those who are unattended. At least part of this information, the attendance-at-birth part, can be collected on the infant and maternal death record, or by matching infant and maternal death records to the corresponding birth record which contains information on attendant. With these data, studies may be made of the incidence of infant and maternal mortality among a cohort of births, some of which had medical attendance and some of which did not.

International recommendations

Because of the differences among countries in the definition of physician, midwife, nurse, and so forth, the tabulations made on this item cannot be expected to have strict international comparability. In spite of this, the United Nations recommends[17] that the item "attendant at birth" should have first priority in collection and be defined as "the physician, midwife, nurse, or other person who delivered the mother". Since these data are primarily of national concern, the classification adopted needs to be meaningful for national purposes. The intent of the international recommendation is to stimulate the collection of information of this type, which will help reveal not only medical-care needs but also factors influencing infant and maternal mortality.

Problems of obtaining data

Whenever there is a medical attendant at the delivery, there should be no difficulty in recording the identity of this individual. The chief difficulty with respect to the item and its subsequent use in certain tabulations is that, in many parts of the world, most deliveries are unattended (except by a lay person), and the answer to the question on "attendant" will be "none". This is not a difficulty in obtaining information on the item, except in the sense that its subsequent use in more detailed tabulations will be limited by the small frequencies.

Another difficulty which may be mentioned is one which would affect the national comparability of statistics in a country of diverse population groups or customs, as well as international comparisons. This is the problem of defining a physician, a nurse, a midwife, or other attendant. Usually national requirements set forth the qualifications for each of these types of attendants, but care must be taken to ensure that regional customs do not impair comparability.

[17] *Principles for a Vital Statistics System, op. cit.* p. 11, 13.

Birth order

See "Number of children born to this mother".

Birth-place

See "Place of birth".

Cause of death

Uses of data

The cause of death of an individual or a foetus is one of the most important items on the death and foetal-death statistical report. The dependence of the public-health authorities on vital statistics stems largely from their reliance — in the absence of morbidity data — on cause-of-death statistics as indicators of the health of the population and as guides for public-health programmes. Because of this dependence, the completeness and accuracy with which the report on cause of death is made are of prime importance.

The fundamental nature of this item in public-health work has been set forth in the Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death, where the objectives of the public-health programme have been stated in these words:

> "The most effective public health objective, of course, is to prevent the precipitating cause [of death] from operating. For these purposes, the most useful single statistic is that relating to the underlying cause."

It may be added that, as has been noted previously, the use of cause-of-death data is enhanced by cross-classifying this characteristic by age as well as by other pertinent factors such as sex, certifier, hospitalization, and the like.

International recommendations

League of Nations Health Organisation. The problems of reporting cause of death were the subject of an international conference held in Geneva, 21-27 August 1925. The participants in the conference were directors of central statistical bureaux and heads or technical advisers of medico-statistical offices in countries where cause-of-death statistics were prepared elsewhere than in the central statistical office.

The conference recommendations bearing upon the various problems of securing an efficient system of statistics on cause of death centred on the following points:

1. Certification of cause of death by attending physician.
2. Separation of medico-statistical information from statement made for use of civil authorities.
3. Confidential character of certification of cause of death.
4. Uniformity of death certificate in regard to the principal questions relating to cause of death.
5. Uniform principles and rules for selection of cause of death for primary tabulation in cases where more than one cause is given.
6. Instruction of medical students in principles and purpose of certification.
7. Centralization of all demographic statistics and their direct tabulation from the certificates.
8. More detailed and uniform presentation of statistics, especially the use of five-year age groups

by sex, specification of urban and rural districts, and of monthly distribution.

9. International regulation of inquiries into terms of doubtful significance.
10. Preparation of an international handbook of causes of death, defining terms in use in the different countries.

With respect to point 1, which deals with the certification of cause of death by a physician, the recommendation was that such certification is desirable, that it should be required wherever the number of physicians is adequate to the task, and that where physicians in adequate numbers or adequately dispersed are not available, every effort should be made to increase the number of physicians.

With respect to points 2 and 3, namely the separation of the medico-statistical information from that prepared for the civil-registry authorities and the confidential character of cause-of-death data, it was agreed that "a full and frank statement of cause of death can often be obtained only when kept strictly confidential and not revealed to members of the family. . ." Therefore, it was considered most logical to keep the medical statement, which is given only for scientific purposes, entirely separate from any statement made for the use of civil authorities. The merits of this recommendation may be debatable, but there is some evidence that a considerable improvement in mortality statistics, especially mortality from venereal disease and alcoholism, would result if the medical report were made confidential. On the other hand, for legal purposes there is need for information on the type of death, i.e., natural or violent.

Points 4 and 5 of the League's recommendation — on securing uniformity in the cause-of-death questions and on rules for selecting primary cause — are particularly important. The League of Nations recommendation on the form of the cause-of-death certification recognized two questions: (*a*) the principal cause, and (*b*) the independent contributory causes. If one country asks simply "cause of death" with no instructions provided for occasions when more than one cause is involved, it becomes apparent that the tabulation of this item cannot be compared with that of a country which requires "primary" and "contributing" causes, defined in a specific manner. If one informant is required to give an answer to a question worded simply "cause" while another must complete a detailed medical statement, it is obvious that the results will not generally be comparable. It is acknowledged, of course, that even if international agreement on a specific form of medical certification is obtained, each physician will still make the decision as to the amount of detail he will report within the given framework. However, from a statistical point of view, uniformity of reporting forms would tend to produce more adequate information.

Systematic inquiries into terms of doubtful significance (point 9) are carried out in a number of countries.[18] Whenever the cause ascribed to a case is a term not acceptable as a cause of death, where there was an omission of information, or where the evaluation of the reported sequence of direct and antecedent causes is in question, the report is referred to the informant for additional information.

The correction of obvious errors or the requesting of additional information in doubtful cases could be better done by a medical consultant, but even in the absence of such assistance, it is desirable in any case to provide for a review of cause-of-death reports with the object of completing the form or clarifying ambiguous information. Carelessness on the part of the informant in filling out the medical certification, and the use of unsatisfactory terminology, can only be corrected by constant vigilance. In no case, however, should the basic information be changed except by a physician who originally prepared the report.

World Health Organization. The first nine points outlined and discussed above are still the crux of the problem of cause-of-death reporting. The International Conference for the Sixth Decennial Revision of the International Lists of Diseases, Injuries, and Causes of Death and the World Health Organization Expert Committee on Health Statistics have promulgated recommendations on most of these points and in particular with reference to points 1, 3, 4, 5, 6, 8, and 9.[19] Recommendation of a revised "International Form of Medical Certificate of Death", a facsimile of which was given in chapter VIII, and the rules for its use are the outstanding recent contributions to the standardization of cause-of-death reporting.[20]

With reference to medical certification of foetal deaths, no international standard report form has as yet been proposed because of the lack of sufficient national experience to determine the best design. However, there is some evidence[21] that the most effective form might be one which parallels that recommended for deaths in general, that is, one designed to set forth the cause of foetal death in a sequential arrangement rather than in two mutually exclusive categories of maternal and foetal causes.

The preparation of statistics on cause of death involves a host of problems in addition to those mentioned above, chief of which is that of classification. As noted in the Introduction to the most recent revision of the "Classification",[22] "the aims of statistical classi-

[18] See Amplification of Medical Certification of Cause of Death: inquiries to certifiers concerning incomplete or vague statements. (World Health Organization, *Bulletin,* Supplement 5), Geneva, 1953.

[19] See Reports of the Expert Committee. World Health Organization, *Technical report series,* No. 5, No. 25. and No. 53; as well as "Regulations No. 1" (Manual . . ., *op. cit.*).

[20] Medical Certification of Cause of Death: instructions for physicians on use of International Form of Medical Certificate of Cause of Death. (World Health Organization, *Bulletin,* Supplement 3), Geneva. 1952. Supplementary Interpretations and Instructions for Coding Causes of Death: Addendum 1 to the Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death. (World Health Organization, *Bulletin,* Supplement 6), Geneva, 1953.

[21] *1955 Revision of Standard Certificate of Fetal Death.* Department of Health, Education, and Welfare. Public Health Service. National Office of Vital Statistics. Washington, 30 July 1954. 6 p. Mimeo.

[22] Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death; 6th revision of the International Lists of Diseases and Causes of Death adopted 1948, vol. 1 (World Health Organization, *Bulletin,* Supplement 1), Geneva, 1948. p. xii.

fication of disease cannot be better summarized than in the following paragraphs written by William Farr nearly a century ago":

"The causes of death were tabulated in the early Bills of Mortality (Tables mortuaires) alphabetically; and this course has the advantage of not raising any of those nice questions in which it is vain to expect physicians and statists to agree unanimously. But statistics is eminently a science of classification; and it is evident, on glancing at the subject cursorily, that any classification that brings together in groups diseases that have considerable affinity, or that are liable to be confounded with each other, is likely to facilitate the deduction of general principles.

"Classification is a method of generalization. Several classifications may, therefore, be used with advantage; and the physician, the pathologist, or the jurist, each from his own point of view, may legitimately classify the diseases and the causes of death in the way that he thinks best adapted to facilitate his inquiries, and to yield general results.

"The medical practitioner may found his main divisions of diseases on their treatment as medical or surgical; the pathologist, on the nature of the morbid action or product; the anatomist or the physiologist on the tissues and organs involved; the medical jurist, on the suddenness or the slowness of the death; and all these points well deserve attention in a statistical classification.

"In the eyes of national statistics the most important elements are, however, brought into account in the ancient subdivision of diseases into plagues, or epidemics and endemics, into diseases of common occurrence (sporadic diseases), which may be conveniently divided into three classes, and into injuries the immediate results of violence or of external causes."

The development of a standard classification scheme for cause of death is by far the most intensive work carried out in the field of vital statistics. Efforts to classify cause of death began as far back as the time of Sauvages (1706-1777).[23] In 1853, the First Statistical Congress appointed a Committee composed of Dr. Marc d'Espine of Geneva and Dr. William Farr of England to develop a classification which could be adapted for international use. At the following Congress in 1855, two separate lists were reported by the Committee on the basis of which the Congress selected a compromise list of 139 rubrics. This list was revised in 1864, 1874, 1880, and 1886, but never gained wide acceptance. In 1891, the International Statistical Institute (successor to the Congress) appointed Dr. Jacques Bertillon chairman of a committee to prepare a classification of cause of death, and his report was adopted by the Institute in 1893. The detailed list of his classification contained 161 titles; there were 99 titles in an intermediate list and 44 in an abridged classification.

This so-called Bertillon Classification received rather general acceptance and, in 1899, the International Statistical Institute passed a resolution urging all countries to adopt the list as well as a plan for regular decennial revisions. The revision of 1900 resulted in a detailed classification of 179 groups and an abridged classification of 35. Subsequent revisions were made in 1909, 1920, 1929, 1938, and the most recent in 1948. The seventh international revision conference was held in Paris, 21-26 February 1955.

The best description of the 1948 revision, which is called the International Statistical Classification of Diseases, Injuries, and Causes of Death, can be found in the Manual[24] of the same name. It is as follows:

"The taxonomic philosophy of the present classification is somewhat eclectic, as no strictly systematic classification is really practicable; but in general, the broad groups have followed the principles of the previous International Lists of Causes of Death. The classification deals first with diseases caused by well-defined infective agents; these are followed by categories for neoplasms, allergic, endocrine, metabolic and nutritional diseases. Most of the remaining diseases are arranged according to their principal anatomical site, with special sections for mental diseases, complications of pregnancy and childbirth, certain diseases of early infancy, and senility and ill-defined conditions including symptoms. The last section provides a dual classification of injuries. Although the general order of the classification follows that of the previous International Lists of Causes of Death, departures have been made from it whenever it seemed expedient, in order to secure a better arrangement of related categories, or to provide expansion required in meeting the needs of morbidity statistics.

"The Detailed List presented . . . consists of a list of 612 categories of diseases and morbid conditions, plus 153 categories for classification of the external cause of injury and 189 categories for characterization of injuries according to the nature of the lesion. A decimal system of numbering has been adopted in which the detailed categories of the classification are designated by three-digit numbers. In many instances, the first two digits of the three-digit number designate important or summary groups that are significant. The third digit divides each group into categories which represent specific disease entities or a classification of the disease or condition according to some significant axis such as anatomical site. Further, the detailed or three-digit categories have not been numbered consecutively, but numbers have been omitted in order that the summary character of the first two digits could be preserved wherever they are meaningful. No additional three-digit categories should be introduced in the classification except when the list is revised by international agreement. The numbering system has been designed purposely as a closed system; that is, the third digit under each broad group begins with '0' and continues consecutively for the number of categories in that group."

The "International Statistical Classification" is accepted as the standard classification for World Health Organization Member Nations under article 2 of the "Regulations No. 1", which specifies that "each Member shall code mortality statistics in accordance with the International Statistical Classification of Diseases, In-

[23] *Ibid.* For a complete history of these efforts, see p. xiii-xxii.

[24] *Ibid.* p. xxx-xxxi.

juries, and Causes of Death with or without four-digit subcategories, and using for the purpose the Tabular List of Inclusions and Alphabetical Index".[25] "Regulations No. 1" further specifies in articles 4 and 5 that "statistics of causes of death in respect of the territory of a Member, taken as a whole, shall be published in accordance with the List of three-digit categories . . . or, if this is not possible, in accordance with the Intermediate List of 150 Causes". For geographic subdivisions of a country, the Intermediate List or, alternately, the Abbreviated List of 50 Causes is recommended.

United Nations. The Statistical Commission[26] gave the item "cause of death" first priority and also endorsed the work done by the League of Nations and the World Health Organization by recommending, in Principle 309, that cause of death be defined as:

> "the morbid condition or disease process, abnormality, injury or poisoning leading directly, or indirectly, to death. Symptoms or modes of dying such as heart failure, asthenia, etc., are not considered to be causes of death for statistical purposes. The *underlying cause of death,* which, rather than the direct or intermediate antecedent cause, is the one to be adopted as the main cause for tabulation of mortality statistics may be defined as (*a*) the disease or injury which initiated the train of morbid events leading directly to death, or (*b*) the circumstances of the accident or violence which produced the fatal injury".

The Commission also made recommendations on the other points set forth on p. 123, but it broadened the approach to these problems by removing them from the limiting context of "cause of death" and placing them in perspective in relation to vital statistics as a whole. For example, "certification" is the subject of Principle 209, which in designating the informant for vital statistics in general, states that "as far as possible, medical certification of cause of death should be the responsibility of the attending physician". The uniformity of death certificates in regard to principal questions relating to cause of death is recommended in Principle 307, where it is suggested that the form adopted for reporting of cause should conform as far as possible to the "International Form of Medical Certificate of Cause of Death". Principle 306 recommends that not only cause-of-death data, but all data collected for statistical purposes be the object of close scrutiny and a continuous querying procedure designed not only to clarify the facts, but also to educate the informant so that in the future data may be improved. This same Principle recommends training of medical personnel in the principles and purpose of vital statistics in general and especially in certification. Centralization of compilation for all vital statistics is recommended in Principle 404.

In making recommendations for tabulation of cause-of-death statistics, the United Nations[27] has endorsed the use of the International Statistical Classification of Diseases, Injuries, and Causes of Death, and has specified the classification scheme to be used in each recommended tabulation.

Problems of obtaining data

The international recommendations made by the League of Nations, the World Health Organization, and the United Nations, set forth above, constitute a rather comprehensive statement of the problems of obtaining cause-of-death information. Perhaps the most important of these problems are the need for medical certification of cause of death and the standardization of reporting forms.

In chapter III, it was shown that registration of death is obligatory in every country studied. Although the *fact of death* is obliged to be declared, the certification of the *cause of death* is a different matter. Certification of cause may be accomplished in three ways: (*a*) the person making the declaration of death may present to the registrar the attending physician's signed certificate certifying to the cause; (*b*) when the attending physician is not obligated to make a certification or when no physician was in attendance, a coroner (the physician or official appointed by public authority) may be sent to examine the corpse and to certify to the cause of death; and (*c*) in the absence of either an attending physician's report or that of a coroner, the declaration of the lay person registering the death is accepted.

These three methods of securing information on cause of death also provide three degrees of accuracy of information. Obviously, the information provided by the attending physician would tend to be the most accurate of the three.[28] In the absence of an attending physician, the cause of death certified by the physician or coroner who only examined the body after death would have the next degree of accuracy. Finally, in the absence of medical certification of any type, the non-medical declaration of the individual reporting the death would have minimal accuracy.

These specific degrees of probable inaccuracy, based as they are on degrees of professional competence and opportunity to determine the exact cause of death, are further aggravated by the reluctance of the physician in some instances to record for public perusal the true cause of death. This reluctance is based on the fact that certain diseases have acquired a social stigma, or their divulgence may have legal or financial implications, which may motivate the family and the attending physician to suppress information which would otherwise become public record.

The problems introduced by the distinct sources or grades of information on cause of death are complicated further by the variations in the form in which the cause may be reported. It has been pointed out previously that uniformity in the statistical report form is essential to good reporting. Uniformity in the reporting of cause of death is even more important, because this is one item of information on which standardization of questions and instructions is required not only to increase accuracy of reporting but also to facilitate subsequent

[25] World Health Organization, *Official Records,* No. 13, p. 349.

[26] *Principles for a Vital Statistics System, op. cit.* p. 12-14.

[27] *Ibid.* p. 21.

[28] If an autopsy were performed, it would provide the most accurate appraisal of the cause of death, but since autopsies are not performed routinely, this preferred source of information contributes little to the over-all quality of cause-of-death statisics.

processing. Variation in the amount of detail required of or reported by the informant in respect of this item is one of the most fundamental problems in vital statistics.

Certifier

USES OF DATA

As noted above, the reliability of cause-of-death statistics varies with the proportion of deaths in which the underlying and direct causes are certified by a medical practitioner. Because of gradations of precision in cause-of-death certification, deaths cross-classified by cause of death and type of certification can provide information which may be used not only to evaluate the quality of the cause statistics, but also to provide an index to the small geographic areas which appear to be in need of physicians or where medical services are not reaching the public.

Because of its fundamental nature in evaluating cause-of-death statistics, information on the "certifier" becomes essential to the evaluation and analysis of cause of death statistics.

INTERNATIONAL RECOMMENDATIONS

Recognizing the basic importance of this item of information, the United Nations[29] formulated a definition of certifier and recommended that the item be included in a minimum list of statistical information to be collected on death reports. The definition is as follows:

> "CERTIFIER is the person who certified the cause of death, i.e., the physician or surgeon who attended, the medical practitioner who examined the body, or the coroner, midwife, nurse, or layman who reported the cause."

The intent of the definition is to obtain the name and title of the person who certified the cause of death by (*a*) having been in attendance, (*b*) having examined the dead body, or (*c*) having simply reported the death.

The type of certification can be classified in its simplest form as "medical", "other", and "not stated", but in order to give some indication of the type of *medical* certification involved and to clarify the related concept of medical attendance, it is desirable that a distinction be made between certification by the attending physician and that made after the death by the examiner or by the pathologist. If these distinctions are made, the classification of type of certification would be as follows:

by medical attendant
by medical examiner
by pathologist
by non-medical person
not stated

If desired, the non-medical category could be further subdivided into coroner (non-medical), midwife, nurse, and layman.

PROBLEMS OF OBTAINING DATA

The outstanding problem connected with obtaining information on the type of certification is the lack of data which would allow one to evaluate the accuracy of the report. All medically certified causes are not equal in quality. The knowledge and skill of the physician in making the diagnosis, his willingness to report completely, and the existence of fads for reporting certain diseases all affect the ultimate result. The information on certifier goes one step toward defining the accuracy of the cause-of-death report, but it does not cover the entire problem.

Citizenship

See "Nationality".

Date of birth

This item of information is not to be confused with date of occurrence of a live birth. For purposes of this discussion, date of birth refers to the birth-date information required for calculation of the age of the mother or father of a newborn child, of the deceased person, of the bride and groom, or of the divorcees.

USES OF DATA

See under "Age," p. 120.

INTERNATIONAL RECOMMENDATIONS

Because the utility of the item "date of birth" lies in its ability to serve as a base for the calculation of intervals of time, it is essential that the detail with which it is expressed be uniform and of such character with respect to the terminal dates that the exact interval of time in completed units may be computed. In order to standardize the procedure, the United Nations Statistical Commission has recommended[30] (1) that date of birth be a first-priority, required item of information on vital-statistics reports and (2) that it be defined as follows:

> "DATE OF BIRTH (of parents, of deceased, of bride and groom, of divorcees) should be expressed as year, month, and day of birth, that is, in detail equivalent to that given for 'date of occurrence of event' in order that exact interval between the two dates may be determined in completed years, months, weeks, days, or hours of life, as required. If it is not possible to establish date of birth, give 'age' as defined . . . above."

From two dates which give day, month, and year, any interval of time larger than one day may be calculated. Age at death, at marriage, at birth of first child, at divorce — all can be calculated in completed units of time, provided the same degree of detail is given for each date. It will be noted that this definition does not appear to suffice for the derivation of the age of a child less than one day old. However, it implies that for these deaths of infants, it will be necessary to record, in addition, hour of birth and death as well as year, month, and day.

PROBLEMS OF OBTAINING DATA

See under "Age," p. 122.

Date of marriage

USES OF DATA

In connexion with legitimate live births and foetal deaths, the date of marriage becomes the base from which one may derive duration of marriage at birth of child or at delivery of foetus. When duration of marriage is cross-classified by age at marriage, age of mother, birth order, and so forth, very fundamental fertility information becomes available. Patterns of family formation basic to the forecasting of population trends are revealed by such tabulations.

A study of the duration of marriage among divorces which dissolve marriages of women in the child-bearing age is important to an understanding of the fertility

[29] *Principles for a Vital Statistics System, op. cit.* p. 12, 14.

[30] *Ibid.* p. 11-14.

potential of a population, while study of the entire divorce problem and its cause will certainly involve an analysis of divorces by duration of marriage.

International recommendations

Date of marriage is recommended for collection on the statistical reports of live birth, foetal death, and divorce; on the latter, it has first-priority status. The internationally recommended definition[31] follows very closely that suggested for date of birth, especially in respect of the detail required, and takes cognizance of the use to which this item of information will be put.

> "Date of marriage in connexion with legitimate births is the day, month, and year of the marriage of the parents of the child or foetus. For marriages being dissolved by divorce, it is the day, month, and year of the current marriage."

Duration of marriage which will be calculated on the basis of date of marriage is defined as the time elapsed between the exact date of the marriage and the date of the other event, e.g., the live birth, the foetal death, or the divorce.

The classification of the duration item depends on the use to which the information will eventually be put but, in general, the United Nations suggests that duration of marriage be classified as under one year, in single years to nine, 10-14, 15-19, 20 and over, and not stated. Such a classification has been used for presenting international data on live births in the 1948, 1949-50, and 1954 *Demographic Yearbooks.*

Problems of obtaining data

Even though the useful information derived from this item is duration of marriage, still date of marriage like date of birth should be requested on the statistical report rather than duration itself. The reasons why the date of the occurrence of an event is likely to give more accurate information than a statement of the interval of time involved have been discussed in some detail with regard to age, p. 122. Suffice to say here that reported periods of duration of marriage would almost certainly tend to concentrate around the numbers ending in zero, two, five, and eight. They would also show an abnormal frequency in the one-year group, especially in connexion with the live-birth report where such rounding would tend to mask premarital conception.

Another problem, which is probably true for any item calculated between dates, has to do with the bias introduced when duration is calculated not from the complete dates but solely from the *year* of marriage and *year* of birth. The first duration group to be affected is the under-one-year category. Computation of duration on the basis of years alone would allocate to the under-one-year group only those events which took place in the same calendar year as the marriage. All those which took place within 12 months but in the next calendar year would automatically be counted as of one-year duration. Thus, the under-one-year group would always be understated, and the effect on subsequent single-year duration period may be one of overstatement or understatement depending on the proportions included erroneously. The total effect is difficult to evaluate, but some idea of its probable magnitude might be obtained from the following tabulation which shows 1952 live births in the Netherlands, tabulated by duration of marriage. In this tabulation, "duration" has been calculated both as time elapsed between exact dates and as time elapsed between years only.

Table C. Live births by duration of marriage: Netherlands, 1952

Duration of marriage	*Time between dates*	*Time between years only*
Total	230,686	230,686
Under 1 year	32,084	10,775
1 year	27,359	35,606
2 years	22,938	24,555
3 years	21,091	21,463
4 years	20,492	20,681
5 years	20,161	20,570
6 years	16,326	19,542
7 years	8,486	12,170
8 years	7,769	7,291
9 years	53,980	8,167
10-14 years		32,993
15-19 years		13,011
20 years and over		3,724
Unknown		138

It will be noted that the under-one-year category is affected to the greatest degree, being understated by 200 per cent, and that every other group, except the eight-year class, is overstated by the "year" calculation.

One other problem is the inaccuracy in reporting either date of marriage or duration of marriage in cases where the informant has been married more than once. Even when first marriage is specified as the reference point, there is a tendency to report information relating to present marriage. In using duration information, a cross-check of some type should be carried out in order that such inaccuracies may be revealed. One tabulation which may serve to reveal reporting errors of this type is the cross-tabulation of number of children born and duration of marriage.

Date of occurrence

Uses of data

Date of occurrence of a live birth, of a death, of a delivery of a dead foetus, of a marriage, or of a divorce is the fundamental item of information for registration and for vital-statistics purposes. For registration, this is an identifying and essential item of legal information. For statistical purposes, the date when an event occurred is the conventional time reference of all vital-statistics tabulations.

Besides its fundamental use in all vital-statistics tabulations, date of occurrence has the additional function of serving as the end point for the computation of exact intervals of time such as age at death, age of mother at birth of child, age at marriage, age at divorce, duration of marriage at birth of child, death or divorce, duration of fatal illness, and so forth. The date of occurrence of the vital event is obviously of prime importance statistically.

International recommendations

Because of its wide implications on tabulation and on the calculation of time periods, it has been recommended[32] that this item be included among the minimum on each statistical report of a vital event and that full detail be given. The definition suggested is as follows:

[31] *Ibid.* p. 14.

[32] *Ibid.* p. 11-14.

"DATE OF OCCURRENCE (of live birth, death, delivery of dead foetus, marriage or divorce) is the exact date when the event occurred, and should be expressed in terms of day, month, and year, and hour if appropriate."

In order that the frequency of occurrence of a specified type of vital event may be compared with that of another, the two must relate to comparable time periods. To facilitate the attaining of comparability in time, the United Nations has recommended[33] classification of time according to the Gregorian calendar:

"407. *Tabulation by calendar periods*

"Final tabulations should refer to a Gregorian calendar period, i.e., solar month, quarter, or year, as appropriate. If for reasons of climate or other considerations national vital statistics are more meaningful on a different time base, provision should be made for supplying solar calendar-period tabulations in addition."

It is, of course, possible to count vital events according to their date of occurrence within lunar-year periods rather than solar. In such a system, months would be defined in 28-day periods, and there would be 13 months in a calendar year. However, such a system would make impossible comparisons with other phenomena tabulated on solar periods. Unless calendar reform is adopted universally, the internationally recommended procedure will continue to refer all vital statistics to Gregorian calendar periods.

PROBLEMS OF OBTAINING DATA

The difficulties involved in obtaining this item of information are not many, inasmuch as it has fundamental importance to registration. However, statistical reports sometimes fail to include the detail desired, that is, day, month, and year.

Lack of sufficient detail in the report of date of occurrence limits the time-period tabulations which can be made and introduces lack of comparability in statistics, especially those of infant mortality. Obviously, if the year of occurrence alone is reported, annual tabulations alone are possible. If, in addition, the month of occurrence is given, tabulation by month can be made. Since weekly tabulations of occurrence are not made routinely because of the lag in reporting, the day of occurrence is not so important in this connexion. But for calculating age at death of infants under one month, for example, day of occurrence of both the birth and the death is certainly required, as is the hour, for calculation of ages less than one day. The precision of other "duration" calculations will be affected similarly by lack of detail in the date-of-occurrence information.

Date of registration

USES OF DATA

This item of information is justifiable as a statistical item primarily because of its use in evaluating the efficiency of the registration system. It is generally conceded that vital-statistics tabulations, to be meaningful and comparable from area to area and from time period to time period, should be made according to the date of the occurrence of the event. Because the registration method requires that, following the occurrence of the event, a definite period of time be allowed during which registration may take place, events registered within a specified period of time will include not only those which actually occurred during the period, but some which occurred in a previous period. Thus, for example, if the time allowed for registration of a live birth is 60 days, monthly tabulations on a date-of-registration basis would always include some occurrences of at least 60 days past. As a matter of fact, a very large proportion of the registrations would relate to events which occurred even earlier. An analysis of the date of occurrence of events being registered currently will provide insight into the lag with which registrations are being made and retrospectively give some index of the probable under-registration problem.

INTERNATIONAL RECOMMENDATIONS

As in the case of other items which refer to "dates", the United Nations[34] has recommended completeness of detail, as follows:

"DATE OF REGISTRATION (of live birth, death, foetal death, marriage, or divorce) should be expressed as day, month, and year when the legal registration was made."

PROBLEMS OF OBTAINING DATA

The problems of reporting this date are primarily the same as those discussed in connexion with other items of a "date" nature, that is, the amount of detail to be reported. In the case of this date, however, the opportunity of obtaining year, month, and day is better than with other dates, inasmuch as it is a matter of record in the registration office. Nevertheless, a deficiency may occur when the statistical report is a list relating to a month without any differentiation by day.

Duration of marriage

See "Date of marriage".

Economic characteristics [industry, occupation, and status (as employer, employee, etc.)]

USES OF DATA

Statistical information on economic characteristics of the parents of a newborn child or dead foetus, of the decedent, of the participants in a marriage or a divorce, is of great interest sociologically, medically, economically, and demographically. Any attempt to describe or measure the economic and social position of a population requires statistics of economic characteristics, not the least of which are natality, mortality, nuptiality, and divorce by industry, occupation, and status (as employer, employee, etc.).

It will be noted that three items of information are mentioned here — industry, occupation, and status. These three are the indicators of economic and social status which should be studied together. From a strictly demographic viewpoint, the least valuable is industry, but it must be recognized that data on all three are necessary in order to interpret fully the statistics on any one.

Although they have relatively minor usefulness from a demographic viewpoint, industry differentials in mortality are of particular importance to public-health work. Analyses of mortality according to industry, together with the interrelationship of other factors such

[33] *Ibid.* p. 18.

[34] *Ibid.* p. 14.

as age and sex, provide the bases upon which industrial-hygiene programmes for the protection of employees can be developed. In cases where an industry is responsible for hazards to living, such as the production and release of noxious gases or other health-impairing substances, the health of an entire community may often depend on such studies. The analysis of mortality by industry thus may provide a guide for public-health work in its broadest connotation.

The need for investigation of the relationship between occupation and mortality has long been felt. As early as 1840, Dr. Villermé[35] published the results of a study showing the variation in mortality for wage earners as compared to proprietors. Various other studies have followed in France, Great Britain, the United States, Netherlands, Switzerland, Italy, Sweden, Hungary, and Norway — a summary of which, together with an extensive bibliography, will be found in "Mortalité, Profession et Situation Sociale" by Jean Daric, National Institute of Demographic Studies.[36] The most recent important study of this type is the tenth of a series of decennial studies issued by the Registrar-General of England and Wales. This report[37] is a summary of occupational mortality data grouped into five social classes and a limited number of sub-classes.

Because occupation is related to the standard of living achieved, it can be employed as an index to socio-economic status. The effects of certain types of occupation on mortality and natality, as well as the effect of female employment on family size and on perinatal mortality, can all be studied by relating the characteristic of occupation to others such as age, birth order, and cause of death, due allowance being made for the fact that one characteristic is inextricably interrelated to another and, therefore, cannot be completely isolated in effect. Socio-economic status, as measured by occupation, may also be a factor in explaining nuptiality and divorce differentials. Such studies are difficult to make not only because of the interrelationships of factors but also because of the difficulty of obtaining strictly comparable populations on which to compute rates. But they are of such fundamental importance to demographers, economists, sociologists, and public-health workers, that they must be included in any modern vital-statistics programme.

The important contribution that statistical studies of occupational mortality can make has received recent recognition at the Eighth International Conference of Labour Statisticians.[38] Resolution III, which covers this point, is given in its entirety below:

"The Eighth International Conference of Labour Statisticians,

"Having been convened at Geneva by the Governing Body of the International Labour Office, and having met from 23 November to 3 December 1954,

"Recognising the important contribution that statistical studies of occupational mortality and morbidity can make in showing the relationship between the health of workers and the occupations they follow, and in particular, in disclosing unhealthy or hazardous occupations, where markedly depressed health standards in general or specific health hazards exist,

"Noting that at present only a few countries have published statistics of occupational mortality, although dependable materials in the form of adequate records of death registration and satisfactory population census data probably exist in a number of countries,

"Noting that the available statistics of occupational morbidity are extremely fragmentary in character, but that the introduction in recent times of sickness insurance schemes covering increasingly wider sections of the population in a number of countries offers possibilities for a proper development of systematic statistics of occupational morbidity in these countries, though subject to reservations as to international comparability on account of important differences in the provisions of these schemes,

"Recognising that the implementation of the *International Statistical Classification of Diseases, Injuries and Causes of Death* evolved by the World Health Organisation, the adoption of the *International Standard Industrial Classification of all Economic Activity* by the Economic and Social Council, and the adoption of the Recommendations on the *International Standard Classification of Occupations* by the International Conference of Labour Statisticians provide elements for international comparability in occupational mortality and morbidity statistics,

"Requests the Governing Body of the International Labour Office

"(a) to instruct the Office to study, in co-operation with the World Health Organisation and the United Nations such data in this field as may be available in the various countries with a view to their publication;

"(b) to advise the States Members and the World Health Organisation as to the importance attached by the International Conference of Labour Statisticians to the compilation and publication of the statistics of occupational mortality and morbidity."

Occupation alone does not tell the whole story, however. Men engaged in the same occupation may bear quite different relationships in terms of status, that is, they may be the employer or an employee or they may work for themselves. The differences in status may contribute to differences in income and standard of living and therefore may be assumed to influence levels of mortality and natality. To obtain meaningful vital statistics according to industry or occupation, it is desirable therefore, that all three items, namely, industry, occupation, and status, be considered. In addition

[35] *Tableau de l'état physique et moral des ouvriers.* Jules Renouard et Cie., Paris, 1840, 2 vol.

[36] "Mortalité, Profession et Situation Sociale" by Jean Daric. *Population.* No. 4, Paris, October-December 1949. This outstanding article has been translated and published in English under the title *Mortality, Occupation, and Socio-Economic Status* by the National Office of Vital Statistics, U.S. Public Health Service, Federal Security Agency. (Vital Statisics—Special Reports. Selected Studies, Vol. 33, No. 10, Washington, 21 September 1951.)

[37] *The Registrar-General's Decennial Supplement, England and Wales 1951.* Occupational Mortality, Part 1. H.M. Stat. Off., London, 1954. 75 p.

[38] *Record of the Eighth International Conference of Labour Statisticians.* International Labour Office. Document G.B.128/3/1, Geneva, 1-4 March 1955. Resolution III, Appendix, p. 15-16.

to their use in providing meaningful statistics, reports on "status" have an equal — if not greater utility — in checking the accuracy of the reports on industry and occupation. Likewise, the report on industry may help to interpret that on occupation and vice versa. It is essential therefore that each be included on the statistical reports.

International recommendations

International organizations have been concerned for many years with problems of the definition and classification of economic characteristics, but interest has centred primarily on their implications with respect to the census of population. Because of the close relationship which must be maintained between census and vital statistics, it seems appropriate that the definitions derived from these studies of census methods should be applied to vital statistics. Accordingly, the United Nations[39] has recommended that industry, occupation, and status be included on all vital-statistics reports and that they be defined in the way which will increase correspondence with population census data.

Industry. The definition suggested for industry is:

> "Industry (branch of economic activity) refers to the activity of the establishment in which an individual is employed, or the kind of business he operates. The time reference of the industry to be reported on vital records, as well as the treatment of persons who have never worked or who are retired, should be consistent with procedures adopted for population census purposes."

The recommended standard for achieving comparability in the classification of data by industry is the International Standard Industrial Classification of all Economic Activities (ISIC). It was approved by the Statistical Commission at its third session (April-May 1948) and recommended for international use by the Economic and Social Council at its seventh session (July-August 1948).

This International Standard Industrial Classification[40] — like the International Statistical Classification of Diseases, Injuries, and Causes of Death — represents a series of necessary compromises or a reconciliation of different viewpoints. Unlike the cause-of-death classification, the classification of industries adopted for national use may differ from the ISIC in detail, but it should be convertible to the international standard. Convertibility ensures that the national data, when summarized according to the standard (ISIC), will provide some degree of international comparability. As noted in the Introduction to the International Standard:

> "The purpose . . . is not to supersede existing national classifications, but to provide an up-to-date framework for the international comparison of national statistics. In the case of countries that already have classification systems, a desirable degree of comparability may be achieved simply by a regrouping of figures obtained under the national classification, but in these cases it is considered essential that all the necessary elements for such a re-grouping be obtainable from national statistics. For countries that have no existing classification and wish to develop one, this standard classification will serve as a useful guide. Even if it is not possible for such countries to classify their figures in all the detail shown in this classification, they may be able at first to use the major groups listed in part III and later subdivide these major groups, or some of them, into the groups shown in part IV."

The Standard Classification is constructed on the decimal system, the first digit of which provides nine major divisions as follows:

Division 0—Agriculture, Forestry, Hunting and Fishing
Division 1—Mining and Quarrying
Division 2-3—Manufacturing
Division 4—Construction
Division 5—Electricity, Gas, Water and Sanitary Services
Division 6—Commerce
Division 7—Transport, Storage and Communication
Division 8—Services
Division 9—Activities not adequately described

Each of the nine major divisions is provided with 10 possible subdivisions (two-digit major groups), of which only 44 are assigned. The three-digit groups at the next decimal level provide the most detailed classification of, theoretically, 999 categories. The amount of detail desired for any national tabulation will be determined on the basis of the use to which the data will be put and the feasibility of the cross-classifications required.

The history of the Classification, the principles underlying it, its structure, its application, and the procedures for classification, interpretation of reported data, and development of national classifications convertible to the ISIC, will be found in *Application of International Standards to Census Data on the Economically Active Population.*[41] The International Standard Industrial Classification itself is reprinted in that publication as Appendix IV, p. 109-116.

Occupation. The United Nations recommended definition of occupation for purposes of vital statistics takes the following form:

> "Occupation is the trade, profession, or type of work performed by the individual. For vital records, the time reference and treatment of retired and pre-labour force individuals should correspond, as in the case of 'industry', with the concept adopted for the census of population."

Certain aspects of occupation receive particular emphasis in different countries. The training required for a job, the level of skill required, the materials involved, the location of the work, the machines or tools used, all have been used as criteria in classifying occupations. The International Standard Classification of Occupations adopted for population-census purposes is not based on any special criterion, but it tries to establish broad groups which can be identified in all

[39] *Principles for a Vital Statistics System, op. cit.* p. 12-15.

[40] *Official Records of the Economic and Social Council, 7th Session, Supplement No. 5B* (E/795/Add.1). Also, *International Standard Industrial Classification of all Economic Activities.* United Nations. Statistical Office. Document ST/STAT/SER.M/4, Lake Success, 31 October 1949. 31 p.

[41] *Application of International Standards to Census Data on the Economically Active Population.* United Nations. Department of Social Affairs, Population Division and Department of Economic Affairs, Statistical Office. Document ST/SOA/Series A, No. 9, 1951. p. 18-52. (Sales No. 1951.XIII.2)

countries. The 10 major groups of the classification are as follows:

1. Professional, technical and related workers
2. Managerial, administrative, clerical and related workers
3. Sales workers
4. Farmers, fishermen, hunters, lumbermen and related workers
5. Workers in mine, quarry and related occupations
6. Workers in operating transport occupations
7. Craftsmen, production process workers and labourers not elsewhere classified
8. Service workers
9. Occupations unidentifiable or unreported
10. Members of the armed forces

Nine of the 10 categories of this classification were adopted, together with recommendations on the procedures to be followed in applying the classification, by the Seventh International Conference of Labour Statisticians.[42] The tenth category was suggested by the Population Commission and the Statistical Commission of the United Nations at their fifth sessions in 1950. Although the classification was recommended specifically for population census data, the Seventh International Conference of Labour Statisticians noted that:

> "The Classification may also be utilized where appropriate for other types of statistics which may be classified by occupation, such as data on industrial accidents, employment and unemployment from non-census sources, vital statistics and migration statistics, etc."

Since the adoption of the ten-major-group classification of occupations, the International Labour Office has been studying the possibility of subdividing these major groups into two- and three-digit categories. At the Eighth International Conference of Labour Statisticians held in Geneva, 23 November - 3 December 1954, a provisional minor-group (two-digit) classification of occupations within the framework of the ten-major-group classification was adopted. At the same time, minor changes of an editorial nature were made in the major categories. This provisional classification of 72 minor groups, which will provide guidance for the further development of the Classification and for current use in summarizing occupational data, may be found in *Record of the Eighth International Conference of Labour Statisticians.*[43]

Status. A great deal of confusion has developed over the actual terms to be used in describing "status". In the past, various names such as social status, industrial status, or occupation status have been used to convey this concept, but the term, now accepted for international usage is "status" defined as follows:

> "STATUS (as employer, employee, etc.) refers to the status of an individual with respect to his employment, that is, whether he is an employer, worker on own account, employee, or unpaid family worker."

The United Nations Population Commission has also paid attention to the definition of each of the components of the recommended definition. At its fifth session in 1950, the Commission proposed, in the interests of international comparability, that all countries adopt for census practices the following definitions of the major status categories:

"Employees

"This group should be defined as including all persons working for public or private employers and receiving remuneration for their work in money wages, salary, commission, tips, piece-rates, or pay in kind. Among the groups to be classified as *employees* are the following:

"(1) All persons working for private employers (or private organizations) for wages or salary;

"(2) All persons working for any branch of the government, including paid elected officials and members of the armed forces;

"(3) Managers, directors and other salaried officials of economic enterprises who do not *own* the businesses in which they work, even though they may perform the same functions as employers;

"(4) Persons who work for companies or employers and who receive a percentage of their sales as remuneration (except persons who by virtue of their share of proceeds of an enterprise are classified as own-account workers);

"(5) Persons who work solely for tips, without wages or salary;

"(6) Persons doing piece-work at home or in a shop for one or more employers rather than for their own clientele;

"(7) All domestic servants (not including persons who take in laundry, sewing, etc., in their own homes);

"(8) Professional persons who work for salaries or wages.

"Employers

"This group should be defined as including all persons who operate their own economic enterprises, or who engage independently in a profession or trade for profit or fees, and who employ in connexion with their businesses one or more workers other than unpaid apprentices. Persons operating economic enterprises in partnership should be classified as employers if their enterprises engage *employees*. An individual who employs no persons other than domestic servants in the home does not meet the requirements for inclusion in the employer group, unless such servants are employed in connexion with an economic enterprise, e.g., a boarding house.

"Workers on own account

"This group should be defined as including all persons who operate their own economic enterprises, alone or in partnership with other owners, or who engage independently in a profession or trade for profit or fees, or who operate a farm which they own or rent for cash or share of the crop or proceeds, and who have no employees in their enterprises other than unpaid family workers or unpaid apprentices. Persons who work for profit or fees in their own home should be included.

"Unpaid family workers

"This group should be defined as including persons working without pay, for a specified minimum

[42] International Labour Office. Geneva. The International Standard Classification of Occupations; report prepared for the Seventh International Conference of Labour Statisticians. Geneva. 1949. (*Studies and Reports, New Series,* No. 15.)

[43] *Op. cit.* Resolution II, Appendix, p. 9-14.

amount of time or a minimum proportion of a full-time day, week, month, or year (depending on the time reference of the census questions on economic activities) in an economic enterprise operated by any member of the household. Wherever expedient, the minimum adopted should be equal to approximately one-third of what is considered in each country concerned to be a normal amount of working time during the period to which the questions refer. Although unpaid family workers usually receive room and board, and often receive cash allowances, these should not be considered as pay in their case, since they are not dependent on the work performed. All such persons should be included in the category of unpaid family workers, and only those who receive an actual wage or salary for their work should be classified as 'employees'."

The above definition provides automatically a classification scheme for this characteristic. It is suggested, however, that the four groups be augmented by the addition of another, namely persons not classifiable by status, distinguishing (*a*) experienced workers with status unknown or inadequately described, and (*b*) unemployed persons who have not previously been employed.

A classification by status alone is, of course, not very useful. To know that the death rate varies according to whether the deceased was an employer, an employee, an unpaid family worker, or a worker on own account is not of particular importance, unless these categories are further subdivided or cross-classified by the branch of economic activity (industry) or the type of work done (occupation). The combination of status with either industry or occupation may reveal interesting and reliable differentials upon which action may be based.

Problems of obtaining data

The problems of obtaining useful information on industry, occupation, and status are problems of (1) definition with respect to time, (2) establishing correspondence between population-census procedures and those of registration statistics, and (3) asking the question in such a way as to provide enough information to distinguish one from the other.

The problem of definition with respect to time involves the consideration of whether the birth, the death, the marriage, or the divorce should be classified according to the industry or occupation in which the individual concerned was working at the time of the event, irrespective of the duration or length of his employment there, or to the industry or occupation in which he has usually worked.

An additional difficulty is encountered for persons who work at more than one activity at the same time or who change jobs so often as to have no usual occupation. All of these difficulties are not subject to solution by themselves. Any decision must take account of the methods and procedures used in connexion with the censuses of population. This is so because the population census provides the base for computation of rates without which analysis of vital statistics by economic characteristics is very limited.

The problem of achieving correspondence between the vital statistics and the enumerated population is a difficult one. Several examples will suffice to indicate the nature of the difficulties encountered. If the population census investigates economic characteristics as of the day of the census while reports on vital events require a statement on industry, occupation, and status as of the date of occurrence of the event, it is obvious that the economic characteristics reported for persons dying, giving birth, marrying, or divorcing that year will (depending on industrial mobility) agree more or less with those reported at the census and, therefore, vital statistics for that year will correspond to the population base. But it is also obvious that the farther from the census date one gets, the less likely it is that the decedents, the parents, the grooms, or the divorcees will still be in the same economic categories as they were at the time of the census. This factor of labour change will, of course, vary from year to year, from country to country, and by geographic divisions within a country, but for persons who retire after the census, those who enter the labour force, and those who leave it or change their sphere of employment immediately following the census date, there will be an almost universal problem.

When the census enumeration refers to "usual occupation", then the vital-statistics reports, in order to correspond, should also request "usual occupation". This arrangement would appear to present a solution to the problem of correspondence except that it raises in turn the problem of defining "usual" in a manner to meet labour-force and vital-statistics needs.

These examples of non-correspondence between reports on vital events and the census enumerations serve to emphasize the problems of reporting occupation and industry in a manner which will make it possible to relate the natality, mortality, or nuptiality group to its corresponding population base. The definitions used and the methods of population enumeration employed must be thoroughly studied, and the instructions to registrars must present the required concepts in such a way that maximum correspondence will be attained.

The form in which the questions on these items are presented on the vital-statistics reports has a great deal to do with the response which can be expected. If, as is sometimes the case, the report asks for "occupation" with instructions for the registrar to fill in not only occupation, but industry as well, there is every chance that the answer will be satisfactory for neither. If the report calls for industry *or* occupation, again the results will be consistently neither one nor the other. Similarly, provision of inadequate space for the answer to the questions will result in incomplete information. Explicit questions accompanied by clear definitions and sufficient space, clearly labelled for the answers, is the method most likely to succeed in obtaining adequate and useful information on industry, occupation and status.

A great deal has been written on the problems of obtaining economic characteristics in the censuses of population.[44] These discussions are applicable equally to vital statistics. In addition, attention is directed to two studies which together review the problems and suggest solutions. The first of these is *Statistical Meth-*

[44] See *Population Census Methods, op. cit.* Also, *Application of International Standards to Census Data on the Economically Active Population, op. cit.*

ods for Measuring Occupational Morbidity and Mortality,[45] prepared by the International Labour Office (League of Nations), and the second is the review by Jean Daric mentioned above.[46]

Hospitalization

Uses of data

It is somewhat difficult to establish one term which will represent the concept intended here. Some national vital-statistics reports call this item "institution"; others, "exact place of occurrence"; still others, "locality" or "place". The word "hospitalization" is used here and in the *Principles for a Vital Statistics System* to represent the idea of the circumstances under which a birth or death occurred, that is, whether it was in a medical-care facility, in an organized institution such as a prison, or in a private home.

From an administrative viewpoint, tabulations of live births, foetal deaths, and deaths by hospitalization in this sense give information which is useful in planning, guiding, and evaluating medical-care programmes. Such data indicate the extent to which medical facilities are being used and, conversely, they may show the need for such services in areas where they are not available. From the public-health viewpoint, tabulations such as these may reveal the relation of hospital care to the control of foetal, neo-natal, infant, and maternal mortality as well as mortality from certain causes of death.

International recommendations

Although there are no international standards which would permit strict comparison of hospitals or institutions on an international basis, the United Nations Statistical Commission[47] has recommended that for national statistics the term "hospitalization" be used on the live-birth, death, and foetal-death statistical report to refer "to the actual place where the event occurred, as for example in a hospital, institution, private home, or other location". It may be that the replies to this question in one country might be couched in terms of the identifiable name of the institution, while in another, the generic term alone might be used. In either case, the answers could be classified into the three or more categories indicated. With such a classification, rough evaluations of the effect of these factors may be made even on an international basis, because the word "hospital", however defined, implies medical care of some type. A further refinement could be made by cross-classifying this item with "attendant", medical or non-medical, or preferably, in further detail.

Problems of obtaining data

The major problem is that of definition. In order to be strictly comparable from one geographic region to another, the word "hospital" should represent the same concept. The problem of deciding what constitutes a hospital or an institutional home for the aged or a penitentiary as opposed to a jail is a national problem, although some work on standard concepts is being started. If the report calls for the name of the hospital or institution, then the coding of the item may be done centrally and some uniformity of interpretation achieved. If the report calls for the generic term, an institution code to which the registrar may refer for guidance will help to accomplish the goal of national comparability. Such a code can often be developed from the census schedules if the definitions are clear.

Industry

See "Economic characteristics".

Language

Uses of data

Like birth-place, race, religion, and nationality, data on language are useful for studying ethnic differentials in natality, mortality, nuptiality, and divorce within a country. The linguistic question may be, on the whole, a more sensitive criterion of ethnic group than any of the other topics used for this purpose. There are two basic reasons for this. First, linguistic differences tend to persist until complete cultural assimilation has taken place and second, they are usually indicative of other cultural differences not immediately subject to measurement. Data on birth-place have the disadvantage of failing to reflect cultural assimilation of the foreign-born and, conversely, they fail to measure the extent of cultural or ethnic differences which remain within the second or native-born generation. These secondary characteristics of a cultural nature may be revealed by linguistic differences. On the other hand, it must be recognized that the same language is often spoken by several population groups whose other cultural or ethnic traits may be widely divergent.

International recommendations

In the United Nations *Principles*, "language" appears as an optional item which, for national purposes, a country may wish to include on its statistical reports. No definition is recommended, but it may be noted that the United Nations Population Commission, in recommending items of information to be collected in the population censuses to be taken in or around 1950, included "mother tongue", which they defined as "the language spoken in the individual's home in his early childhood".[48] This definition may further be interpreted as the language which the individual's parents spoke or that which he first learned to speak.

Some countries, however, use a different concept in collecting population data on language. Because of the necessity for maintaining strict correspondence between vital statistics and censuses of population, it is suggested that the definition adopted for vital statistics correspond with the definition used in the national census.

Problems of obtaining data

The definition of the information required and the promulgation of clear instructions will overcome most of the problems of data collection in this field. It is important that the "language" desired be clearly defined either as mother tongue or as language currently spoken and that no ambiguity exist between these concepts and "knowledge of a designated language". For ethnic-origin analyses of population composition, data on mother tongue are considered more useful than other types of language data. Questions on language currently spoken may fail to distinguish ethnic groups, because people of many such separate groups may all

[45] International Labour Office. Geneva. Statistical Methods for Measuring Occupational Morbidity and Mortality. Geneva, 1930. 208 p. (*Studies and Reports, Series N* [*Statistics*] No. 16.)

[46] *Mortality, Occupation, and Socio-Economic Status, op. cit.*

[47] *Principles for a Vital Statistics System, op. cit.* p. 11-12, 14.

[48] *Official Records of the Economic and Social Council, 7th Session, Supplement No. 7* (E/805), Annex A, Part II. p. 15.

speak one tongue — that of the country of residence. On the other hand, language spoken may correspond in the main to the mother tongue in some instances as, for example, in multi-language countries such as Canada, Switzerland, Belgium, India, Ceylon, Israel, and so forth. Questions on ability to speak a designated language are, of course, not particularly significant for ethnic analysis.

Legitimacy

Uses of data

Despite the recognized deficiencies of data on legitimacy, the item provides the basis for certain tabulations of live births and of foetal deaths which have important sociological significance and which are of concern to health and welfare authorities. As a matter of fact, the World Health Organization Subcommittee on the Definition of Stillbirth and Abortion[49] recommended that national committees on vital and health statistics be urged to stimulate special studies of live births and foetal deaths designed to explore the interrelation of legitimacy with period of gestation, birth weight, type of birth, and so forth. In a report on illegitimate birth statistics,[50] the United States National Office of Vital Statistics has set forth some of the questions which data on legitimacy, in spite of their shortcomings, might answer. These questions, which are equally applicable to other countries, are the following:

(1) Has there been any increase in the number and rate of illegitimate births?
(2) How old are the mothers bearing children out of wedlock?
(3) What has been the previous child-bearing experience of these mothers?
(4) What is the geographic distribution of illegitimate births?
(5) What proportion of unwed mothers use medical and hospital facilities for delivery of their children?

Sociologists of all countries are certainly interested in the first four questions, and public-health authorities should be interested in these plus the fifth.

The whole problem of legitimacy is broader than these questions would indicate, but the least that can be done is to find ways of ensuring that the misfortune of being illegitimate does not decrease for the infant or his mother the chance of surviving child-birth. The development of tabulations designed to answer the five questions posed above and the establishment of programmes on the basis of the results would go far toward meeting the minimum objective.

International recommendations

Because of its sociological implications, this item was given first-priority status in the United Nations[51] list of items to be included on reports of live birth and foetal death, and a definition has been promulgated, as follows:

> "Legitimacy is the status of the child or dead foetus with respect to being legitimate, that is, considered as the lawful issue of a couple."

It will be noted that this definition places the emphasis on the provisions of the national law and makes no attempt to standardize the concept internationally.

The classification scheme recommended re-emphasizes the lack of international comparability and proposes simply three categories of legitimate, illegitimate (according to national law), and not stated. For national purposes, it may be desirable to further subdivide the illegitimate category into recognized and not recognized, and to divide the not-stated group into not stated, with information on father and without information on father. For purposes of international standardization, it is proposed that the broader groupings be used.

Problems of obtaining data

The collection of information on legitimacy is subject to many problems, chief of which is the reluctance on the part of the informant to record the fact of illegitimacy and the consequent tendency to either fail to register such a birth or to mis-state the facts concerning it. This reluctance to give information is more pronounced when the question asked is the direct one, i.e., legitimate or illegitimate. To avoid this directness, some countries have substituted a question concerning the marital status of the mother, answers to which do not, of course, give exactly the same type of information as the direct question, which refers to the legal status of the child.

The difficulties of gathering data on legitimacy status, and the reluctance on the part of some officials to include such information on the legal register, have led many areas to consider abandoning the topic entirely. Omission of the item might increase completeness of registration, but in the process valuable social data would be lost.

All of the difficulties mentioned above refer to national collection of data. From the international viewpoint, little comparability exists, due partly to the variations in reporting and also to the basic legal differences. National laws vary widely with respect to the status of the child born out of wedlock and also with respect to his legitimation. On these legal points, international comparability may never be achieved, but despite the national differences, comparative data are of some interest from a sociological point of view.

Level of formal education

Uses of data

Because of its usefulness in the study of the interrelationships of economic, social, and demographic factors, this item was one recommended for inclusion in the data to be obtained in population censuses in and around 1950. Classification of births, deaths, marriages, and divorces by level of education of the parents, of the decedent, of the bride and groom, or of the divorcees would yield information with which to examine the demographic differentials involved.

International recommendations

The *Principles*[52] place level of formal education in

[49] World Health Organization, *Technical report series*, No. 25. p. 16.

[50] *Illegitimate Birth Statistics: United States, 1938-47* by Sam Shapiro. Federal Security Agency. Public Health Service. Vital Statistics — Special Reports. Selected Studies. Vol. 33, No. 5, Washington, 15 February 1950.

[51] *Principles for a Vital Statistics System, op. cit.* p. 11, 12, 14.

[52] *Ibid.* p. 12-13.

the second-priority category and propose that it be an alternate to "literacy". In the matter of definition, that promulgated by the United Nations Population Commission as a guide for data to be obtained in the 1950 census programme[53] was adopted for vital statistics, *viz.* that level of formal education should aim "to show the highest level of instruction to which the individual has attained in the country's regular educational system or its equivalent". This definition does introduce some ambiguity by the use of the word "level" in the definition, but this can be clarified by using the classification of schools suggested by the United Nations Educational, Scientific and Cultural Organization (UNESCO).

The classification of educational level in terms of instruction attained may be approached in two ways. Either a classification of school years completed may be made, or a classification of years of schooling in schools at various levels may be introduced. The latter is the basis of the recommendation of the Population Commission of the United Nations in "Tabulations of Data from Population Censuses to be Taken in or about 1950".[54] The recommendation was as follows:

> "The tabulations of returns on level of formal education should show the highest level of schooling attained by each individual, in terms of single numbers of completed grades or years in elementary school, intermediate school, college, etc. At its third session the Commission recommended that if data on this subject were confined to the population above a stated age, that age should not be higher than 25 years. The tabulations should be made, for each sex, at least by the following age groups: under 25 (if the minimum age for the data is below 25 years), ten-year groups from 25 to 64, 65 years and over. However, since the minimum age used in many censuses may be 20 years or lower, data for the age groups 5 to 9, 10 to 14, 15 to 19, and 20 to 24 may also be tabulated separately, to the extent that they are included in the range of ages to which the data on level of education apply."

The Second Inter-American Statistical Congress[55] carried the classification somewhat farther. The pertinent parts of the resolution on "Educational and Cultural Statistics" were as follows:

> "2. That the principle of *educational level* be adopted for the international *classification* of educational statistics.
>
> "3. That the following *classification* be used . . .. (a) Preschool education; (b) primary and elementary education; (c) secondary and intermediate education; (d) university or higher education . . ."

The latest and most comprehensive in the series of international definitions and classifications for level of education is that suggested by the Expert Committee on Standardization of Educational Statistics of the United Nations Educational, Scientific and Cultural Organization (UNESCO).[56] According to this suggestion, level of formal education is defined as "the number of successfully completed years of schooling", and schools should be classified by level and type, as follows:

> "(a) Education, by level
>
> "(i) *A school of the first level* (e.g. nursery school, kindergarten, infant school) provides education for children who are not yet ready to enter a school of the second level.
>
> "(ii) *A school of the second level* (e.g. elementary school, primary school) provides basic instruction in tools of learning, as well as education for the social and emotional development of the children.
>
> "(iii) *A school of the third level* (e.g. middle school, secondary school, high school) provides general or specialized instruction more advanced than that given at the second level. As to schools of the third level the education is subdivided into:
>
> "(iii a) general education, which does not aim to prepare the pupils for a certain profession or trade.
>
> "(iii b) vocational education, which aims to prepare the pupils directly for a certain profession or trade.
>
> "(iv) *An institution of the fourth level* is one which requires, as a minimum condition of admission, a certificate of completion of a school of the third level or its equivalent (e.g. an entrance examination). Institutions of this level include universities and higher professional schools."

Problems of obtaining data

As with other demographic data, the problems of obtaining information on this item have their origin in the definition. Each country may understand something quite different from the words "formal education". The designations as elementary, secondary, and so forth, are not internationally comparable. Moreover, the concept of level of education is not universally applicable. In some Asian and African countries, where education facilities are neither numerous nor commonly available, the concept would not yield data of great utility. Actually, the item is useful primarily for countries with advanced systems of formal education and with a majority of their child population under that system. For such countries, it will yield more useful information than literacy.

Literacy

Uses of data

Like level of education, data on literacy in the field of vital statistics provide information on the cultural differences in the rates at which births, deaths, marriages, and divorces are taking place. The sociological differentials in the natality, mortality, nuptiality, and dissolution rates might further be explored by the introduction of the factors of occupation and, for births, that of legitimacy. However, because of the difficulties involved in collection (see below), data on literacy can be said to provide only the minimum required, especially for highly literate populations. For such literate groups, level of education gives a better indication of social or cultural development.

[53] *Official Records of the Economic and Social Council, 7th Session, Supplement No. 7* (E/805), Annex A, Part II. p. 15.

[54] *Official Records of the Economic and Social Council, 9th Session, Supplement No. 7* (E/1313), Annex 2, para. 26, p. 20.

[55] *Second Inter-American Statistical Congress, Bogotá, January 1950: Summary and Resolutions.* Preprint from *Estadística,* Journal of the Inter American Statistical Institute. Vol. VIII, No. 26, March 1950. p. 26.

[56] *Report of the Expert Committee on Standardization of Educational Statistics.* Document UNESCO/ST/R.4 rev., Paris, 9 April 1952. p. 5-6. Mimeo.

INTERNATIONAL RECOMMENDATIONS

Literacy, which has second priority for collection on statistical reports of vital events, has no value except in so far as vital rates may be computed based on corresponding populations. To achieve correspondence, the definitions adopted for literacy in vital statistics should follow those employed in the national census of population. In accordance with this principle, the United Nations Statistical Commission has recommended[57] that the definition suggested for 1950 censuses be adopted for vital statistics, that is, that *literacy* for vital statistics should be defined for purposes of international comparison as:

"ability both to read and to write a simple message in any one language. If this question is confined to the population above a stated minimum age, the minimum should not be higher than fifteen years".

This definition corresponds in effect to that proposed in 1952 by the UNESCO Expert Committee on Standardization of Educational Statistics,[58] except that UNESCO provides also for a category of "semi-literates". The UNESCO definition is as follows:

"A person is considered *literate,* who can both read with understanding and write a short simple statement on his everyday life.

"A person is considered *semi-literate,* who can read with understanding, but not write, a short simple statement on his everyday life."

The United Nations Population Commission has made certain recommendations with respect to the classification of census data on literacy. Although these recommendations refer primarily to population censuses, they may well provide a starting point for consideration in connexion with vital statistics.

"The Commission recommended that if data on literacy and illiteracy were confined to the population above a stated age, that age should not be higher than 15 years. It is desirable that the tabulations of these data show for each sex, at least the following age groups: under 15 years (if the minimum age for data on this subject is below 15 years), 15 to 19, 20 to 24, ten-year groups from 25 to 64, 65 years and over. However, in view of the fact that in many censuses the minimum age for data on this subject may be 10 years or younger, in such cases the tabulations should show also the age group 10 to 14 years, in order to extend the amount of information available internationally on a comparable basis."[59]

The standardization of classifications and tabulations on statistics of literacy has also been the special interest of the UNESCO. The General Conference at its seventh session in November 1952 approved the Report of the Committee of Experts (cited above) as "suggestions" and authorized continued study in the field. In so far as literacy classifications are concerned, the Expert Committee suggested that:

"(i) Literacy status should be classified in the following groups: literates; illiterates, subdivided, where appropriate, into semi-literates and full illiterates.

"(ii) Each of these groups should be classified by sex and by the following age groups: 10-14, 15-19, 20-24, 25-34, 35-44, 45-54, 55-64, 65 and over.

"(iii) Where possible, the age group 10-14 could be broken down into single years.

"(iv) Where the detailed age groups given above cannot be adopted, at least the following groups should be separated: 10-14, 15-44, 45-64, 65 and over."

These recommendations are still under study, however, and do not yet constitute international standards.

PROBLEMS OF OBTAINING DATA

The major problem is that of definition. The definition of literacy varies greatly from country to country and, in almost every case, it is subject to interpretation by the interviewer. The variation in the question on vital-statistics reports is not known, but it may be assumed to resemble that present in the population-census schedules where the question may appear as "ability to read and write", "ability to read or not", or "ability to write or not". The topic is sometimes approached in the negative manner, that is, able neither to read nor to write, able to read but not to write, and so forth. It will be noted that all of these questions omit reference to the degree of reading or writing ability, but some of them appear to provide for a category of semi-literates, i.e., able to read but not write. The standardization of a question which will elicit the type of information desired and its clear definition in terms which eliminate in so far as possible the subjective approach will help to achieve accurate information.

Live-birth order

See "Number of children born to this mother".

Marital status

USES OF DATA

Marital status of the decedent is information required for estimating population by marital status and also for analysing mortality by marital status. Such analyses form the basis of public-health campaigns or programmes in so far as they are influential in furthering research into the basic factors. The results of such studies are of value primarily as indicators of areas which should be explored.

Previous marital status of the bride and of the groom, on the other hand, is an essential item of information for an analysis of the nuptiality patterns of a population. When this information is cross-tabulated with age, it may throw some light on family formation and dissolution.

INTERNATIONAL RECOMMENDATIONS

Because the marital-status item on the statistical report of deaths has interest primarily for statistically advanced countries, it has been designated by the United Nations as "second priority". On the other hand, this item in relation to the marriage statistical report is considered of universal interest and, therefore, of first priority.[60]

The internationally recommended definition of marital status for purposes of vital statistics follows that recommended for population-census practice. This is necessary because, in order to make use of the infor-

[57] *Principles for a Vital Statistics System. op. cit.* p. 14.

[58] *Report of the Expert Committee . . ., op. cit.* p. 3.

[59] *Official Records of the Economic and Social Council, 9th Session, Supplement No. 7* (E/1313), Annex 2, para. 25, p. 20.

[60] *Principles for a Vital Statistics System, op. cit.* p. 12, 13.

mation for population estimation or to compute rates, the vital-statistics frequencies must be related to appropriate populations. Total marriage rates, for example, should be computed on marriageable population, i.e., the total of those single, widowed, and divorced. Likewise, marriages according to previous marital status should be related to the corresponding selected population groups, that is, marriages of never-married persons to the single population, marriages of widows to population in the state of widowhood, marriages of divorcees to population divorced. Deaths of single persons should be related to the single population at risk, deaths of married persons to population in the married state, and so forth. In view of these considerations, the Statistical Commission[61] has recommended the following as a standard definition of marital status for vital-statistics purposes:

> "MARITAL STATUS should be expressed in such categories as are required for national purposes but in a manner which will be in conformity with the following concepts as applied to the event being reported: married; in stable *de facto* unions (consensually married); widowed, not remarried; divorced, not remarried; single — that is, not married, widowed, or divorced in the sense stated above. Should it be impossible to obtain information on consensual unions separately, they should be recorded as 'married'."

With the addition of a category of marital status, not stated, the definition of marital status set forth above automatically provides a classification scheme for this item. It is applicable to mortality statistics and also to marriage statistics, inasmuch as the category of "married" for males in polygamous countries is provided. Care must always be taken to retain in the classification a category of not stated. Where cases of unknown marital status are arbitrarily assigned to specific marital-status categories, the methods used should be clearly indicated.

PROBLEMS OF OBTAINING DATA

The chief difficulty encountered in determining and reporting marital status for vital statistics is the identification and specification of consensual unions. This problem is very closely related to that of legitimacy discussed above, and the same as that of marital-status determination encountered in censuses of population. The solution of the problem in both vital and population statistics is based on the principle that in cultures where consensual unions are common, they should be identified separately in the statistics. However, persons who are or who have been in consensual or *de facto* unions are not likely to so report themselves when they are registering a birth, a death, or a new legal marriage. In many cases, births to parents in such unions would remain unregistered. It is likely that reference to married population on the death report covers the legally married only, as is the experience in Japan,[62] in spite of the fact that the census makes no distinction between legal and *de facto* marriages. On the current legal marriage registration, the tendency would probably be to report previous marital status as divorced or as single rather than as consensually married. Therefore, it is not likely that vital-statistics reports will actually give an accurate reporting of the consensual-union marital status.

A study of the vital-statistics reports available for 65 countries reveals that Guatemala provides for *unido(a)* in the check-list answer to marital status on the live-birth and death-statistical reports; that Nicaragua provides for *libre;* Honduras and Mexico specifically group consensually married and formally married together; Haiti, in its statistical report of marriage, distinguishes customary from legal or other. These are the only instances encountered among the reports studied. The failure to distinguish the informal-union from the legal-marriage status either civil or religious, raises the possibility of errors in both the single and the married categories, thus invalidating both.

The term "separated" when used as a category of marital status also introduces confusion. In some countries, the term undoubtedly is used to refer to persons legally separated, that is, separated by judicial action. In other countries, the meaning of the term is not clear. Clarification and standardization of the concept is especially important because of its implications in countries where divorce is not recognized and also in those where there are several types of divorce, as under Moslem law.

Marriage birth order

See "Number of children born to this mother".

Mother tongue

See "Language".

Nationality

USES OF DATA

Data on nationality in respect of the parents of a child, of a deceased person, of persons marrying, or of divorcees provide some measure of the influence of ethnic characteristics on the trends and patterns of natality, mortality, nuptiality, or divorce.

INTERNATIONAL RECOMMENDATIONS

Because of its lack of general meaning for vital statistics, no international recommendations have been made on this item. Nationality is not included in either the minimum or the second-priority list of items for which data are to be collected, but it does appear in the optional national list, the use of which is left entirely to the discretion of each country.

For the guidance of those countries which may wish to try to collect information on citizenship or legal nationality of parents, decedent, or marriage and divorce participants, the recommendation of the Population Commission of the United Nations[63] might be considered. The Commission said that:

> "[1950 censuses of population] should provide for the distinction between (*a*) persons who are citizens of the country where the census is taken, either by naturalization or otherwise, and (*b*) aliens. In addition, wherever feasible, the aliens should be classified by the country in which citizenship is claimed."

[61] *Ibid.* p. 14.

[62] "A Statistical Observation Concerning Married Population in Japan" by Ayanori Okasaki. *Archives of the Population Association of Japan.* No. 1, 1952, p. 55-64.

[63] *Official Records of the Economic and Social Council, 7th Session, Supplement No. 7* (E/805), Annex A. Part II. p. 15.

If vital statistics were classified in the same categories, at least comparability with census returns could be maintained, even though for analysis of vital statistics, the item does not have a strong justification except in certain special instances.

PROBLEMS OF OBTAINING DATA

The inadequacy of nationality data has its basis in the obscure meaning of the term. The confusion between the terms "citizenship" and "nationality" is well known. Although nationality in the legal sense is interpreted to mean citizenship, that is, status with respect to citizen rights such as voting, obtaining passports, and so forth, it is often used in the sense of origin, native stock, or even place of birth. Since its meaning is subject to such variation and confusion, it has been suggested that the term nationality be abandoned and the more specific term citizenship be substituted.

Problems of securing adequate response to the question of nationality are the same as those found in census taking, first, the difficulty of determining exactly what is wanted and of developing a definition and instructions which will make this meaning clear to the registrar as well as to the informant, and second, when the concept of citizenship is adopted, the problem of arriving at the proper designation of stateless persons and of those with dual citizenship. The solution of these problems should follow the practices adopted for the census of population which are outlined above.

Nativity

See "Place of birth".

Number of children born to this mother

USES OF DATA

This item, which is recommended as a desired characteristic of the mother on statistical reports of live birth and foetal death, and on the death report for females of child-bearing age or over, is the one which provides the basis for calculating various types of birth order, that is, total birth order, live-birth order, marriage total birth order and marriage live-birth order, and for studying the influence of fertility on diseases causing death.

Birth-order tabulations in their various forms mentioned above have distinctive special uses. The public-health worker, for example, is interested in knowing the order of birth of the present child with respect to the total issue, liveborn or stillborn, of all previous pregnancies. Total birth order calculated in this way covers the complete previous pregnancy history of the mother and clarifies the relationship between pregnancy history and the probability of producing live-born children. Information on total birth order in respect of infant deaths will show the relationship between birth order and chances of survival.

The distinction between live-born and dead issue of previous pregnancies makes possible to some extent an evaluation of the viability of issue with respect to congenital factors and to environmental or socio-economic elements such as literacy, occupation, legitimacy, and so forth. Such differential analyses of fertility are perhaps made better from data obtained if possible at time of the death of a woman who has reached or passed the child-bearing age. In any case, remedial measures may be undertaken on the basis of analyses which are detailed and thorough enough for this purpose.

Live-birth order — that is, order of the present live birth in relation to all previous live births, nuptial or extra-nuptial — is of special interest to demographers because it gives an indication of the current fertility patterns, that is, it reveals the size of the existing families in which new births are taking place. Thus, if live births are occurring in the high orders, families already formed are being increased, whereas if the highest rates are in the first-birth category, the total birth rate is probably being influenced most strongly by new marriages. The "newness" of the marriage may then be investigated by introducing duration of marriage into the tabulation. Tabulation of birth order and age of mother also opens up important avenues of analysis.

The analysis of foetal deaths by the past history of child-bearing offers interesting possibilities. If, for example, foetal deaths are occurring primarily to women who have had a history of many foetal deaths in past pregnancies, a wide field for medical investigation would be opened. Such an analysis would require foetal-birth order, that is, an order based on foetal deaths only.

For inquiries into the fertility of marriage, total birth order or live-birth order is required. With these data, studies of the fertility patterns of married persons in terms of duration of marriage and age at marriage can be made.

Information on the death report of women of child-bearing age as to the number of children born enables tabulations to be made which can be used to assess completed family size and composition. This same question is often included in censuses of population, and the results of the one-time inquiry are used for fertility analyses. However, data of this type from the census are very limited in their applicability. They are available only once in five or ten years. Except for women who have passed the child-bearing age, they do not represent *completed* experience on the part of the woman, but only a sub-total at one point of time. It is only on completion of her life that the child-bearing accomplishments of a woman can be truly assessed. As one official in Ceylon has noted, "deaths should be viewed not only from the point of view of morbidity analysis, but also as an agent affecting the population relevant to the analysis of fertility". With appropriate data, the possibilities of analyses of fertility patterns by age at marriage, duration of marriage, socio-economic status, etc., are unlimited. Moreover, information of this type derived from vital records can be made available annually rather than solely at the time of the census.

In addition to its use in analysing fertility patterns, this item on the death statistical reports also provides a basis for the study of fertility and infertility in relation to cause of death.

INTERNATIONAL RECOMMENDATIONS

Because of the various uses of this item in the computation of different types of birth orders, the United Nations has recommended[64] that the item have first priority on the statistical reports of live birth and foetal death and second priority in connexion with deaths of women. It has also recommended that wher-

[64] *Principles for a Vital Statistics System, op. cit.* p. 12, 15.

ever the item "number of children born to this mother (or woman)" is used, it should be defined as:

> " 'total issue', that is, all children (*including this one* in the case of the live-birth or foetal-death report) born alive or born dead during the lifetime of this mother, and expressed in such a way as to distinguish (*a*) children now living, (*b*) children born alive and now dead, and (*c*) children born dead. In the case of plural issue, each child or foetus resulting from a confinement should be counted separately. For legitimate births, provision may be made to obtain information on how many children in (*a*), (*b*), and (*c*) above were issue of the current and, in some instances, of the previous marriages. If the distinction between (*a*), (*b*) and (*c*) above is not practicable, the country should endeavour to obtain information on 'total live births to the mother', or nearest approximation".

With such basic data, many combinations required for the study of various demographic and public-health problems may be constructed. In addition, the ability to sum the various segments (*a*), (*b*), and (*c*) of the information makes for accuracy, even though, in practice, the information on children born dead, for example, may not be utilized.

Total-birth order. This tabulation concept, the uses of which have been described above and which is calculated on the information provided by number of children born to this mother or total issue defined above, is:

> ". . . the numerical order of the [child or] foetus (the report of whose [birth or] death is being tabulated) in relation to all previous issue of the mother, irrespective of whether the issue were live-born or dead foetuses, or whether pregnancies were nuptial or extra-nuptial".[65]

Live-birth order. This birth-order concept, like total-birth order, is calculated on the basis of information reported under the item number of children born, making use of the live-born issue only. It is defined as follows:

> "Live-birth order is the numerical order of the child [or foetus] (the report of whose birth [or death] is being tabulated) in relation to all previous live-born issue of the mother, irrespective of whether pregnancies were nuptial or extra-nuptial."[65]

Marriage birth order. It may be desirable for some purposes to base birth order on nuptial or legitimate issue only, excluding all live births or foetal deaths which occurred outside of wedlock. Such a concept may be further limited to issue during existing marriage only. These various limited types of birth orders may be modifications of total-birth-order concept, in which case they are defined as marriage total birth order or the numerical order of the child or foetus in relation to previous legitimate issue of the mother (during existing marriage or during all marriages), irrespective of whether the issue were live-born or dead foetuses. The concept may also be calculated in respect of live-born issue only, becoming therefore marriage live-birth order or the numerical order of the child or foetus in relation to all previous legitimate live-born issue of the mother (during existing marriage or during all marriages, as desired).

In countries where legitimacy is not a major problem, such birth-order calculations provide a fair approximation of the standard total-birth order and live-birth order. But in those areas where illegitimate births predominate, the use of the limited concept does not produce comparable information.

Irrespective of whether tabulations are made of total-birth order, live-birth order, marriage total-birth order, or marriage live-birth order, the classification of this item is the same. It requires only single-number orders up to that which covers the experience of the group under study. In order to obtain some degree of international comparability, the United Nations Statistical Commission has recommended[66] that the single-order classes extend up to 9 with a residual group of 10 and over. A not-stated group is also provided.

Problems of obtaining data

The chief problems of obtaining information on number of children born are the practical ones raised by having to depend for the data on the memory of the informant, and having to include on the statistical reports questions which in effect demand information on previous illegitimate births.

Information on the occurrence of previous foetal deaths (stillbirths), for example, is notoriously deficient. It is deficient for many reasons, one of which is that the informant may fail to remember the facts concerned. If a secondary informant rather than the one directly concerned is responsible, he may lack knowledge of the facts. For these reasons data involving foetal deaths, early, intermediate, or late, tend to be less reliable than those concerning live births, the facts about which would be more widely known by a second person and less likely to be forgotten by the informant. The memory factor may also be aggravated by the reluctance of the informant to reveal extra-nuptial issue. Since there is no way to evaluate this reluctance, the answers to the questions may be invalidated to some degree. Because of the effect of these factors of memory, reluctance, and ignorance, birth order based on live births only is considered more reliable than total birth order.

Quite aside from the difficulties which come from the deficiencies of the data are those which are due to misinterpretation of the question itself. To guard against lack of clarity in the question formulated for inclusion on statistical reports, it might be helpful when drafting questions to keep in mind the following points: (1) Are all children, both living and dead at time of reporting, to be counted? (2) Is the present live birth or foetal death being registered to be included in the number of children reported? (3) Are all children born to this mother involved, or only those of the present marriage? previous marriages?

The recommendation of the United Nations as to the form and definition of this item would tend to establish uniformity and clarity on this troublesome point. The aim is to establish a total which the various parts together must equal. The superficial accuracy of the response can then be subjected to an internal check at least.

[65] *Ibid.* p. 20, 22.

[66] *Ibid.* p. 20, 22.

Number of dependent children

USES OF DATA

This item provides data with respect to divorces which will be of interest to welfare agencies, especially to those concerned with child welfare. Provision for children of broken families is usually made in the decree of the divorce, but it is known that such children may become wards of public agencies in one way or another. Agencies with this responsibility need to know the probable extent of the problem.

Data based on number of dependent children are useful for fertility studies in relation to age or duration of marriage, but in a somewhat limited way. This limitation has its basis in the interim nature of the data with respect to eventual family size.

INTERNATIONAL RECOMMENDATIONS

The *Principles for a Vital Statistics System* recommends that this item have first priority among those collected on the divorce statistical report. In an effort to standardize the factor of age, the Statistical Commission has suggested an upper limit of 16 years in the definition of dependency. The factor of residence has been eliminated by including all living children of the specified age, irrespective of place of residence, and the time reference has been fixed as the date of the petition, because it is at that time that the informant can be questioned most readily with respect to personal particulars. The text of the recommended definition is as follows:

> "NUMBER OF DEPENDENT CHILDREN is the total number of living children under 16 years of age dependent on either of the divorcees at the time the petition is filed."

The Commission, in suggesting a tabulation of divorces cross-classified by number of dependent children and duration of marriage, recommended that the number of children be classified as none, 1, 2, 3, 4, 5, 6, 7 and over, and not stated.[67]

PROBLEMS OF OBTAINING DATA

The difficulty of defining dependency in the sense used here is the source of most of the problems in obtaining comparable data. The upper-age limit of the definitions presently being used in the various countries of the world varies from 16 to 18 years, with a number failing to specify any age whatsoever. The difficulties of obtaining accurate and comparable data have led some countries to request only number of living issue, irrespective of age or dependency status.

The problem of defining dependency may involve also considerations of residence. Children living in the household of either divorcee at the time of the divorce may not constitute the total number dependent on the persons involved in the divorce. The statistics cannot, therefore, be interpreted in terms of total burden or total family size. Likewise, the time reference of the question may affect the answer, i.e., whether the dependency was a fact at the time of the divorce decree or at time of petition. Sometimes, several years pass between the petition and the decree, and so-called dependants may have passed beyond the dependent age in the interval. Since statistical reports on divorce are usually completed by clerks of court, the difficulties of achieving standardization on this item are not insignificant.

[67] *Ibid.* p. 13, 15, 23.

Number of previous marriages

USES OF DATA

This item, like number of children born, provides the information required to compute an "order" — in this case, the marriage order — of the marriage being contracted or the order of the marriage being dissolved. Tabulations of marriages or divorces by marriage order are of sociological importance for the information they may reveal about the stability of marriage. By inference, therefore, they also reveal information on family formation and structure.

INTERNATIONAL RECOMMENDATIONS

The recommendation developed in the *Principles* on this point takes the form of including it as a second-priority item on the statistical reports of marriage and divorce. A definition which is given below is also recommended.

> "NUMBER OF PREVIOUS MARRIAGES (of persons marrying or of divorcees) is the number of marriages entered into *before* the one contracted at this marriage, or *before* the one ending in this divorce, irrespective of whether the last previous marriage was dissolved by death or divorce."

It will be noted that this definition relates to *previous marriages* and specifically excludes the present or current one.

PROBLEMS OF OBTAINING DATA

One fundamental defect in the data obtained on this item, especially if they are used to reveal demographic characteristics of family formation, is that data reported in answer to this question will relate solely to previous legal, formal marriages. In the normal course of events, consensual unions, which demographically are of equal interest in the history of marriage contraction, will not be likely to enter into the computation.

Another potential difficulty might be reluctance on the part of the informant to report any previous marriages, but it is anticipated that the possibility of verification in the registers might deter the informant from giving incorrect information in this respect.

Occupation

See "Economic characteristics".

Period of gestation

USES OF DATA

Information on period of gestation, also known as "gestation period", "utero-gestation period", and "duration of gestation", is useful in connexion with statistics of both foetal death and live birth. Its primary use, of course, is in connexion with foetal deaths, because the classification of these fatalities into "early", "intermediate", or "late", as recommended by the World Health Organization,[69] is based on the period of gestation. Classification by this variable is of major importance because it is only by determining the magnitude of the loss of foetal lives at various periods of

[68] *Ibid.* p. 13, 15.

[69] World Health Organization, *Technical report series*, No. 25. p. 13.

gestation, that an understanding of the characteristics of pregnancy wastage can be obtained. Concentration of foetal deaths at early gestational age may suggest a different medical problem than a preponderance of occurrences near term. Detailed analysis of foetal deaths by the period of gestation in relation to additional variables such as occupation of the mother, age, prenatal care, type of birth, medical condition, and so forth, may be of basic importance to the understanding of pregnancy wastage and its amelioration.

Data on live births classified by period of gestation have two important uses. The first is in connexion with infant mortality. "It is generally accepted that prematurity plays an important role in causing infant deaths". This statement, which introduces the Final Report of the Expert Group on Prematurity,[70] is followed by recommendations on how "prematurity" should be established, that is, by the adoption of the World Health Organization definition[71] which states that "if weight is not specified, a liveborn infant with a period of gestation of less than 37 weeks or specified as 'premature' may be considered as the equivalent of an immature infant for purposes of this classification". Studies of the interrelationships of the factors of weight at birth and period of gestation will go far toward clarifying this still somewhat obscure concept of prematurity. (See also "Weight", p. 148.)

Related to its uses in defining prematurity in the absence of birth weight is the analytical use of period of gestation in studying certain aspects of neo-natal mortality. It is well known that the factors influencing neo-natal mortality are more closely related to those influencing pre-natal or late-foetal-death mortality than they are to those of general infant mortality. It is for this reason that the possibility has been suggested of combining late foetal deaths with neo-natal death for the computation of a "perinatal" mortality rate.[72] The similarity between the causes of deaths occurring immediately before possible live birth and those occurring among new-born infants, makes their related study a necessity. The relating factor is "period of gestation" which should appear on the infant death report. Failing this, the death reports will need to be matched to the corresponding live-birth reports containing information on period of gestation. The analysis of neo-natal deaths by this and other factors such as type of birth, birth weight, birth order, age and occupation of mother, will provide important medical and public-health data. Some of the interrelationships exposed may indicate methods of lowering the incidence of prematurity as a cause of the infant deaths, for example. Certainly, the identification of a group of newborn as premature and, therefore, in need of specialized care will go far toward decreasing the loss from this cause. The prerequisite for such programmes and suggestions for development will be found in the Report of the Expert Group on Prematurity, while descriptions of individual country services are set forth in the report of the *Study Group on Perinatal Mortality (op. cit.)*.

International recommendations

In spite of the multitude of difficulties involved in obtaining accurate data on period of gestation and the impossibility of verification, the information to be obtained from an analysis of even incomplete data of this type is of such importance that the item is considered by the United Nations to be of first priority for foetal-death reporting and of second priority for live births. The United Nations has also recommended a definition which is designed to minimize the problems of reporting mentioned above. The recommended definition,[73] which is based on that used by the World Health Organization Subcommittee on the Definition of Stillbirth and Abortion[74] is as follows:

> "PERIOD OF GESTATION is the number of completed weeks which have elapsed between the first day of the last menstrual period and the date of delivery, irrespective of whether the product of conception was live-born or born without evidence of life."

If this definition is followed strictly, period of gestation would be measured from the beginning of the last menstrual period rather than from probable date of conception, and it would be reported in completed weeks rather than in lunar or calendar months. Finally, the concept would be uniform for live births and for foetal deaths. The errors introduced by the medical difficulties of determining the beginning of the last menstrual period are considered to be minor from a statistical standpoint, the important consideration being the uniform and consistent application of the definition.

The recommendation of the World Health Organization Subcommittee on the Definition of Stillbirth and Abortion[75] was that period of gestation be classified, both for live births and for foetal deaths, in four groups as follows:

Less than 20 completed weeks of gestation	Group I
20 completed weeks of gestation but less than 28	Group II
28 completed weeks of gestation and over	Group III
Gestation period not classifiable in groups I, II, and III	Group IV

But these classes are not detailed enough to identify premature live births in the absence of birth weight in accordance with the international definition of prematurity. In order to meet this need, the Statistical Commission of the United Nations[76] has recommended a standard classification, as follows:

[70] World Health Organization, *Technical report series*, No. 27. p. 3.

[71] Recommended by the First World Health Assembly in 1948 (WHA1.35) for purposes of the International Statistical Classification of Diseases, Injuries, and Causes of Death, and further recommended for "adoption by all countries for purposes of vital statistics" by the World Health Organization Expert Group on Prematurity in 1950. This recommendation of the Expert Group was noted and authorized for publication by the Executive Board, and finally noted by the Third World Health Assembly in resolution WHA3.39.

[72] *Study Group on Perinatal Mortality*. World Health Organization Regional Office for Europe. Document MH/EUR/74.54, Geneva, 1954. 84 p. Mimeo.

[73] *Principles for a Vital Statistics System, op. cit.* p. 15.

[74] World Health Organization, *Technical report series*, No. 25. Annex 1, para. 4(d), p. 13, and para. 9(a), p. 16.

[75] *Ibid.* p. 13.

[76] *Principles for a Vital Statistics System, op. cit.* p. 22.

Under 20 completed weeks,
20-27 completed weeks,
28-36 completed weeks,
37 completed weeks and over,
not stated.

The international definition of period of gestation set forth above specifies that it be reported in completed weeks. Since it will be impossible for all countries to achieve this goal in a short time, period of gestation will undoubtedly continue to be reported in terms of months. If it can be determined that the reported periods are lunar months, there is no difficulty in converting to exact weekly equivalents using a factor of four. But information reported in *calendar* months presents a problem of conversion. In such a case, it is suggested that the calendar months be tabulated according to the following classification, which is roughly comparable to the corresponding week periods of the standard:

Under 5 completed calendar months (under 20 completed weeks)
5 and 6 completed calendar months (20 and under 28 completed weeks)
7 and 8 completed calendar months (28 and under 37 completed weeks)
9 and more completed calendar months (37 completed weeks and over)

Problems of obtaining data

The problems involved in determining the period of gestation are primarily those of measurement and hence of definition. The difficulties of definition are further complicated by confusion in terminology between "period of gestation" and "duration of foetal life or pregnancy". Biologically, the length of foetal life or duration of pregnancy is the time elapsed between the date of conception and the date of delivery or birth. However, the difficulty of determining the initial date has indicated the necessity of introducing another, though similar concept, namely the period of gestation, which is measured not from the moment of conception but from the first day of the last menstrual period, a date considered more easily determined.

The similarity of the two concepts, however, leads to confusion in the reporting of the period. Some medical informants measure the period, erroneously, from the "probable day of conception", that is, 10-14 days after the beginning of the last menstruation rather than from the first day of the last period as recommended by the World Health Organization and the United Nations. Strict adherence to the international standard definition both in concept and in terminology is necessary to improve comparability.

Another difficulty related to measurement is the fixing of the terminal point of period of gestation in cases of foetal death. The actual date of occurrence of a foetal death is difficult to determine, although for medical research it is essential. The date of delivery of the dead foetus is known, however, and in order to simplify the computation of elapsed time for statistical purposes, it is used as the terminal date of gestation. It may be pointed out that the use of delivery date does not introduce an error of any statistical significance, because it is believed to approximate closely the actual date of foetal death.

A second source of difficulty in obtaining accurate data on period of gestation has to do with the method of expressing the elapsed period. If the elapsed period is measured and expressed in months, which is often the case, these units of time cannot with accuracy be converted into weeks unless it is known to which type of month they refer, that is, calendar months of a varying number of days or lunar months of 28 days. Indiscriminate conversion of reported months of gestation by assumptions as to the type of month is revealed in the tabulations by the concentration of gestation periods of live-born infants at 36 weeks. This probably represents the average full-term gestation period of nine calendar months, measured from probable date of conception, converted to weeks by the factor of four. Moreover, a live-born child which appears to be normally developed and which is born at or around the probable time of confinement is often reported as "full term". This, in turn, is interpreted as 40 weeks, the average gestation period measured from the beginning of the last menstrual period. Study of accurate hospital reports has shown that the true distribution of gestation periods for live-born children would take the form of a smooth frequency curve, indicating that excessive heaping at any one period is due to incorrect reporting or computing procedures.

Because of the inaccuracies introduced by the informant reporting the elapsed period ambiguously or as "full term", and the consequent unreliability of conversion to standard weeks, consideration has been given to obtaining, on statistical reports of live birth and foetal death, not period of gestation but the date of the first day of the last menstrual period. With this piece of information, the calculation of the elapsed time between the initial date and the date of delivery could be made in a uniform manner. However, the possibilities of obtaining an answer to this type of question are much less than those of obtaining response to the "duration" question and, for that reason, despite its obvious theoretical advantages, the idea has not found general acceptance.

The problem which overshadows all others in obtaining period-of-gestation data, estimated or calculated precisely, is that of *incompleteness and inaccuracies of reporting*. Unless the delivery occurs in a hospital, the chances of obtaining even moderately accurate answers are very poor. This deficiency may be ascribed to the diffidence, if not inability, on the part of the registrar to elicit an adequate response from the informant, as well as to the inability on the part of the parent to give the data, or a tendency to deliberately understate period of gestation in order to mask pre-marital conceptions. Further, the data once recorded are final, except in so far as querying may revise them, there being no way in which they can be subjected to verification or completion from an independent source. As a result, any tabulation based on period of gestation will usually reveal large frequencies in the unknown category. The bias introduced into the distribution is difficult to evaluate.

Place of birth

Uses of data

This item, known also as birth-place or nativity, is one of those considered of use in investigating the ethnic or geographic differentials in natality, mortality,

nuptiality, and divorce. Natality by birth-place, i.e., country of birth of the mother and/or father, reveals, for countries of large-scale immigration various differentials, the relationship of which to other economic and social factors must be determined. For many years, such studies in the United States, for example, revealed higher birth rates among the foreign born, but these differentials are now disappearing as the foreign-born group is assimilated.

To be meaningful, studies of death by nativity must usually include consideration of cause, occupation, and so forth. Nuptiality and divorce studies by birth-place have sociological implications which may throw light on the various mores in the area, and also on the extent to which the foreign-born population are assimilated by marriage with the native-born.

International recommendations

This, being an optional item suggested for consideration by countries where it might provide useful data, does not appear in the list of items set forth in Principle 308.[77] However, since live births, deaths, marriages, and divorces by nativity must, to have meaning, be related to corresponding population, it is suggested that the item place of birth be defined for vital statistics in the same way as is recommended for censuses. The recommendation of the Population Commission of the United Nations[78] on this point is as follows:

> "Data on place of birth should show (*a*) whether or not a native of the country where the census is taken, and (*b*) if not, the country of birth, according to the national boundaries existing at the time of the census. Governments are urged to adopt whatever measures may be feasible to assure an accurate classification by country of birth in cases where national boundaries have been greatly altered.
>
> "In those countries where it is considered feasible to extend the inquiry on this subject, data should be obtained on place of birth for natives by geographical sub-divisions."

Problems of obtaining data

Interpretation of birth-place or nativity data in terms of ethnic characteristics fails to take account of the fact that many different ethnic groups may be included in the native-born population of any country. The maintenance of cultural characteristics by immigrant groups and the passing of these traits, which may include dietary habits, courtship and marriage mores, and so forth, to their native-born descendants means that nativity statistics will not show the full effect of cultural differences. However, considering the possible sources of ethnic data, it may be said that birth-place will yield more satisfactory information than citizenship, but probably not as adequate as a question on language spoken or mother tongue. The most appropriate item will depend largely on the problems in each individual country.

One reporting difficulty with respect to place-of-birth data needs to be mentioned. It is the problem of deciding how to report the geographic area to which reference is made. The area can be identified (*a*) in terms of the political boundaries existing at the time the statistical report is made; (*b*) in terms of the boundaries as of a selected year; or (*c*) as the area was at the time of birth of the person on whom information is being collected. In countries where political boundaries have undergone major changes, consideration of these problems is of importance in order to obtain the maximum degree of uniformity.

Another point to be covered in the instructions for reporting is the amount of geographic detail desired. For international comparisons, or for over-all national use, "foreign-born" and "native-born" might suffice. But for detailed national statistics, it may be desirable to investigate regional differentials within the country and, for this purpose, the exact locality of birth in each case would be required. Reporting of exact locality may be subject to additional difficulties brought about by the tendency to report place of birth as the location of the hospital in which the birth occurred, rather than the place of residence of the parents — but such errors, if they occur, would be of minor significance.

Place of occurrence

Uses of data

Information on the geographic location of the occurrence of a live birth, a death, the delivery of a dead foetus, a marriage, or a divorce, provides the base for place-of-occurrence tabulations. Such tabulations are basic to a vital-statistics programme, because they establish the totals for the smallest geographic subdivisions of the country. When these are fixed, they serve as units for consolidation into larger geographic areas and as a basis of reference for residence tabulations.

More complex tabulations on an occurrence base are employed primarily for administrative purposes, such as the evaluation of the adequacy of medical-care facilities. Tabulation of live births and foetal deaths in place of occurrence by hospitalization and by attendant may reveal the geographic areas which are deficient in medical-care facilities or in which, for some reason, the population fails to use them. Cross-tabulation by occurrence and residence will reveal the extent to which mothers at the time of confinement seek medical services outside their place of residence.

With respect to mortality, place-of-occurrence tabulations by age and by cause, as well as by hospitalization and type of certification, are of vital importance to the public-health authorities. The knowledge that one or more deaths from communicable disease has occurred in an area may set in motion a train of public-health activities designed to find out where the disease originated and who may have been exposed to it. The occurrence in a certain area of an undue number of maternal deaths, infant deaths, or deaths from certain communicable diseases may point to the need for investigating the circumstances of the deaths in terms of environmental sanitation and availability of medical-care facilities. Place-of-occurrence tabulations meet these needs.

Place of occurrence has little significance with respect to marriage tabulations, because of the fact that the place where a marriage is performed is determined by factors which are not of a demographic or public-health character. Marriages and divorces by place of occurrence will certainly reflect the variation between localities in the imposition of procedural requirements

[77] *Ibid.* p. 11-13.

[78] *Official Records of the Economic and Social Council, 7th Session, Supplement No. 7* (E/805), Annex A, Part II. p. 14-15.

as, for example, in the case of marriages, the health examinations for venereal diseases, or the requirement that a licence be obtained or that banns be proclaimed in advance of the ceremony. Requirements of residence in the case of divorce proceedings make occurrence and residence tabulations synonymous in some areas. Other factors which may influence the place of occurrence of a divorce are the variations in the grounds upon which a divorce may be obtained and the location of the court which has jurisdiction. Occurrence tabulations for marriages and divorces, therefore, have relatively little value for demographic analysis. The place of occurrence of a marriage being dissolved by divorce is used primarily for administrative control purposes.

INTERNATIONAL RECOMMENDATIONS

In the United Nations *Principles for a Vital Statistics System,* place of occurrence is considered a basic or first-priority item for all vital-statistics reports. The definition suggested in Principle 309 to guide the collection of this item of information is as follows:

> "PLACE OF OCCURRENCE is the geographic locality where the birth, death, delivery of a dead foetus, marriage, or divorce occurred. This information should be given in enough detail to enable tabulations to be made for at least the largest administrative subdivisions of the country and for such smaller administrative subdivisions as may be required for national use."

For international uses, the detail suggested in the definition is that which will enable tabulations to be made for the largest national administrative subdivisions. The provision of detail adequate to supply data for smaller subdivisions is dependent upon national needs. Since there is no international standard nomenclature to describe administrative subdivisions of countries, these reporting details cannot be expressed concretely in the international recommendation. However, in general it is desirable to specify *exactly* what is required by phrasing the question in the national words equivalent to "province", "county", "city", "street", and even "number" if required. If the question is put in an indefinite form such as "place of occurrence", a variety of types of answers can be anticipated, ranging from vague to precise. In order to obtain consistent answers, the elements of the desired response must be indicated on the statistical report for the guidance of the registrar.

The tabulation programme recommended by the United Nations[79] suggests that place of occurrence be classified as follows: (*a*) each major civil division, (*b*) each geographic unit next smaller than the major civil division, (*c*) each very important city.

The classification of "places" according to a scheme of this degree of complexity is facilitated by a geographic code. Such a code, constructed on a national basis, assigns to each known geographic unit a unique identification number and provides an index by which any locality reported may be properly identified. Such a code is essential for population-census purposes and, obviously, equivalent geographic codes should be used for the census and vital statistics.

[79] *Principles for a Vital Statistics System, op. cit.* p. 19.

PROBLEMS OF OBTAINING DATA

The manner in which the question is asked is extremely important in eliciting geographic data. Unless the exact geographic subdivisions are specified, it is doubtful whether comparable data can be collected, because one recorder may give the "province" of occurrence while another may supply the complete street address in the locality where the event occurred. The answer to the problem, then, is precision in expressing the question in order that the type and quality of the response may be improved.

Place of usual residence

USES OF DATA

The geographic identity of the place where the mother of the live-born child or the dead foetus, the decedent, the bride and groom, or the divorcees usually lived is required for making place-of-residence tabulations. Such tabulations are generally considered of primary importance for differential analysis of natality, mortality, nuptiality, and divorce.

Classifying natality and mortality data according to place of residence makes it possible to analyse them in relation to age, birth order, socio-economic status, and so forth, to reveal differentials of interest from a demographic and public-health viewpoint. For comparison from one geographic area to another, place-of-residence tabulations alone should be used because they are free from the biases introduced in place-of-occurrence tabulations by the concentration of medical facilities and services in certain areas.

Marriage statistics by place of residence are also free of the artificial inducements of social usage or expedience which raise the incidence of marriages in certain geographic areas. Nuptiality data by residence reveal the regional differences which may involve age, previous marital status, and the like, and also the extent and nature of inter-regional marriages which in some countries may have sociological significance.

INTERNATIONAL RECOMMENDATIONS

Place of residence is recommended as a first-priority item for inclusion on all five statistical reports on vital events. It is not feasible to suggest an international definition of *residence,* since such a concept is dependent entirely on national law, but for statistical purposes the "place of usual residence" has been defined by the Statistical Commission[80] as follows:

> "PLACE OF USUAL RESIDENCE is the geographic locality where the person concerned with the vital event usually lives. This information should be given in enough detail to enable tabulations to be made for at least the largest administrative subdivisions of the country and for such smaller administrative subdivisions as may be required for national use."

It will be noted that this definition follows in general the form of the definition of place of occurrence, and the same comments and suggestions with respect to the form and manner of reporting are applicable. In applying this definition, it should not be overlooked that the major objective is to obtain the closest possible correspondence with the census of population, and the definition for vital statistics should be developed with this goal in mind. What is not required is

[80] *Ibid.* p. 15.

the legal definition of residence, but rather one which will allow place-of-residence rates to be constructed for each geographic unit of the national territory on the basis of the proper corresponding population.

The most detailed classification scheme suggested by the United Nations in the recommended basic tabulation programme[81] is the same for place of residence as for place of occurrence.

From a sociological viewpoint, it may be desirable for some purposes to differentiate vital-statistics tabulations according to whether they refer to an "urban" or a "rural" area. Such a classification of geographic areas is based on the premise that the conditions affecting mortality and natality, for example, are different in urban and rural areas. It is recognized that such an index reflects the joint influence of many factors such as economic progress, cultural attainments and environmental conditions and that it is a substitute for more specific factors involved. It is primarily a national concept, lacking to a large extent international applicability.

In a study of the concept of urban and rural as applied to population censuses,[82] it has been shown that there is almost no comparability from country to country in the matter of definition. Some countries define urban in terms of size of agglomeration; others, by political status of the unit. Each is a practical definition, designed to fit the needs and interests of the country, with few of the elements on which international comparability could be based.

Because of this diversity among countries, the United Nations,[83] in studying this problem, decided to approach it from another and more general angle. Since the size of the agglomeration is highly correlated with community services, and since every population group could be classified according to the size of the agglomeration in which the inhabitant lives or happens to be present, it was suggested that the entire population be classified according to the size of the locality of occurrence, as follows:

Population in places of

(*a*) 500,000 or more inhabitants
(*b*) 100,000 to 500,000 inhabitants
(*c*) 25,000 to 100,000 "
(*d*) 10,000 to 25,000 "
(*e*) 5,000 to 10,000 "
(*f*) 2,000 to 5,000 "
(*g*) 1,000 to 2,000 "
(*h*) 500 to 1,000 "
(*i*) less than 500 "
(*j*) Population not in identifiable agglomerations or clusters (if the whole population is not included in the above categories).

As the best means of obtaining some degree of international comparability on this subject, this classification was suggested in addition to any urban-rural tabulation.

This same suggestion applies to the vital-statistics field. Certainly, there will continue to be tabulations according to each country's definition of urban and rural. But, in order that some comparisons may be made between countries, it is suggested that for demographic and public-health analysis, tabulations be made also on the "city-size" group basis. Since such tabulations depend for interpretation on relating the frequencies to corresponding populations, it will be possible to use them only when population-census tabulations of a similar type are available. For this reason, they will, in all probability, not need to be annual tabulations. The important consideration is that sufficient detail be reported on vital-statistics reports to make a city-size classification possible and that the same definition and codes be employed for purposes of census and vital statistics.

Problems of obtaining data

The difficulties encountered in obtaining place-of-residence data are similar to those problems involved with the reporting of place of occurrence. They are primarily problems of detail and their solution, as noted previously, lies in making the question precise.

Race

Uses of data

This item is one which is used in some countries to establish ethnic differentials in natality, mortality, nuptiality, and divorce. Racial differentials in natality and mortality have been identified in several countries, but in relation to mortality, at least, they appear to have a socio-economic basis rather than an ethnic one. In relation to natality, it appears that race may have a bearing on the definition of prematurity, inasmuch as birth weight, on which the definition of prematurity is based, varies among races. In recognition of this possible relationship and with a view to clarifying it, the Expert Committee on Health Statistics of the World Health Organization has urged, in a resolution taken at its second meeting,[84] that the interrelationships of race with a number of specified factors be studied.

International recommendations

Because of the differing national meaning of "race", international recommendations of a definitive nature have never been made on this item. The United Nations has suggested that certain countries may wish to collect information on this item as an optional and national factor affecting natality, mortality, and so forth. This recommendation will be found in Principle 308 (*b*).[85]

Problems of obtaining data

The problem of obtaining racial data with any meaning lies in the fact that there is no clear-cut definition of race nor of the concept it is supposed to represent. Many countries have omitted the question from their population-census schedules, either because "race" did not represent an important national demographic factor or because a clear-cut definition for census purposes could not be made. It was not included in the list of topics recommended by the United Nations Population Commission for the 1950 censuses of population.

[81] *Ibid.* p. 19.

[82] *Data on Urban and Rural Population in Recent Censuses.* United Nations. Department of Social Affairs, Population Division; and Statistical Office. Document ST/SOA/Series A, No. 8, July 1950. 27 p. (Sales No. 1950.XIII.4)

[83] *Official Records of the Economic and Social Council, 9th Session, Supplement No. 7* (E/1313), Annex 2, para. 47, p. 26-27.

[84] World Health Organization, *Technical report series,* No. 25. p. 16.

[85] *Principles for a Vital Statistics System, op. cit.* p. 11.

An idea of the variation in the meaning attached to the word "race" may be gained from a survey of the concept adopted among the countries which tabulate "race" statistics. In the United States, for example, questions on this topic take the form of "race or colour", which in turn is defined as "white", "Negro", "other". In New Zealand the Maoris, representing a separate race, are distinguished from the non-Maoris, and special definitions have been formulated to cover the problem of reporting those persons not 100 per cent one race or the other. In the Union of South Africa, the distinction is made on the basis of "origin" or "stock", i.e., European, native, and other, the latter including Indians, other Asians, and Coloured (half-castes). The impossibility of obtaining data which have comparative meaning outside the national boundaries is evident.

Religion

Uses of data

For purposes of differentiating ethnic characteristics, questions on religion yield data on differences in natality, mortality, and more particularly nuptiality and divorce. It is known that religion is a pertinent factor in relation to the economic and social organization of peoples. Certain religions forbid divorce; others regulate marriage; certain dietary or other habits of religious origin may have a bearing on the incidence of certain diseases; certain tendencies such as that to have large families early in life may be religious in origin. Many demographic phenomena are susceptible of analysis by the factor of religion if it can be defined and interpreted in a nationally uniform manner. However, religion as an analytical factor for demographic research is limited almost completely to national purposes.

International recommendations

Religion as an item on the population-census schedule was the subject of international action as early as 1872 when the International Statistical Institute recommended its inclusion in the world census schedules. There appears, however, to be no comparable action in the field of vital statistics except that of the United Nations Statistical Commission[86] when it proposed that each country consider the scientific value of collecting information on items, including religion, which would permit analysis of demographic factors in relation to significant social and economic groups within the country.

Problems of obtaining data

The clarification of the meaning of a question on religion is the greatest obstacle to obtaining accurate and meaningful data. A request for information on religion may be answered in several different ways. The answer may represent the religion actually practised or merely that into which the person was born, but to which he has never adhered; it may represent a religion lately ascribed to, which therefore is not of major importance as an ethnic or cultural factor; or it may represent a nominal membership or church attendance of a somewhat social character. Moreover, since some persons do not adhere to, or do not wish to state their adherence to, a religion, there is a tendency for this question to remain unanswered on a large number of reports. In order to obtain usable data, it would be desirable for the question to be phrased in such a way that the answer related to a specified time period, somewhat in the manner that "mother-tongue" questions are designed. The question should also make clear that it is not church attendance which is being investigated but religion in the sense of uncovering basic religious tenets which might have a bearing on natality, mortality, and nuptiality.

Sex

Uses of data

The inclusion in the vital-statistics report of a question on the sex of the new-born child, of the decedent, or of the dead foetus, requires little comment. Sex is a basic characteristic in data describing human beings, and tabulations on most other characteristics are more meaningful cross-classified by sex.

International recommendations

Recommendations for the inclusion of this item of information on vital-statistics reports were initiated at an early date, and they have been endorsed by the United Nations in Principle 308,[87] in which sex is suggested as a minimum-list item of information to be collected on vital-statistics reports.

Problems of obtaining data

The only problem to be encountered in this connexion is one which has to do with the form in which the question is placed on the statistical reports. If the two words "male" and "female" are placed on the report with instructions to strike out the one not pertinent or to check the one pertinent, there is always the likelihood that either the instructions will be misinterpreted and a mark placed on the sex which describes the event, or no entry will be made. In the case of foetal deaths, which can be of unknown sex, there may be a tendency to assign a sex if there is choice between the two words "male" and "female". It is considered more effective, therefore, to provide a blank space into which the recorder writes either "male", "female", or in the case of foetal deaths, unknown, or uses the initial letter of these words to indicate the proper sex.

Status

See "Economic characteristics".

Type of attendant

See "Attendant at birth".

Type of birth, i.e., single or plural issue

Uses of data

The statistical use of this item is almost completely limited to public-health and medical purposes because, demographically, the ratios of single to plural issue are subject to little variation from year to year.

The incidence of neo-natal, infant, and maternal mortality among single and plural issue may be studied and, on the basis of findings, public-health measures involving pre-natal and post-natal care, infant nutrition, immunizations, and so forth, may be instituted.

This item is also of importance in studying the relative incidence of live births and foetal deaths among plural issue. Analyses based on this item, together with

[86] *Ibid.* p. 11.

[87] *Ibid.* p. 11 ff.

tabulations on hospitalization, birth order, age of mother, occupation, etc., may reveal the factors which are related to the foetal death of one or more of the members and thus enable consideration to be given to eliminating or at least minimizing these factors.

International recommendations

In addition to recommending its inclusion as a first-priority item on the statistical reports of live birth and foetal death, the United Nations has also set forth a recommended definition[88] which includes instructions for the details to be reported. It is as follows:

> "Type of birth refers to the single or plural nature of the issue of the pregnancy to which the statistical report relates. Each live-born infant or dead foetus should be characterized as single, twin, triplet, and so forth, and, for each member of a plural birth, provision should be made to indicate the condition of the other member(s) (mates) with respect to being born alive or dead (foetal death), and, if desired, sex."

It will be seen that the definition suggests or recommends that the condition of the other members or mates be given with respect to their having been born alive or born dead. This provision allows the medical studies mentioned above to be made more easily than they could be if the records of all members of the sets had to be matched.

An international recommendation on the classification of type of birth to meet the needs of demographers was also put forth by the United Nations Statistical Commission.[89] It is as follows:

Single —live birth,
foetal death;
Twin —2 live births,
1 live birth and 1 foetal death,
2 foetal deaths;
Triplet—3 live births,
2 live births and 1 foetal death,
1 live birth and 2 foetal deaths,
3 foetal deaths;
and so forth.

It will be noted that the United Nations recommendation envisions a detailed classification with the status of each mate specified. For demographic purpose, this is the recommended classification. For public health, the factor of prematurity could be added if considered essential for special studies or tabulations.

A "Classification of Liveborn Infants According to Type of Birth" was recommended by the World Health Organization in 1950. This classification, which appears in the Supplementary Classifications section of the *Manual*,[90] identifies the issue of each pregnancy as "single", "twin", and "multiple" and further classifies each mate as to whether it was liveborn or stillborn and also whether immaturity was mentioned. The entire classification is as follows:

Single, born without mention of immaturity
Single, born immature
Twin, without mention of immaturity, mate liveborn
Twin, without mention of immaturity, mate stillborn
Twin, immature, with mate liveborn
Twin, immature, with mate stillborn
Multiple born, without mention of immaturity, mates all liveborn
Multiple born, without mention of immaturity, one or more mates stillborn
Multiple born, immature, mates all liveborn
Multiple born, immature, one or more mates stillborn

Problems of obtaining data

There are no outstanding difficulties to be encountered in obtaining a report on the type of birth, except that care needs to be taken to provide adequate and clearly defined space for answers if it is desired to collect information on the condition and sex of the other members. It is usually desirable also to provide for the reporting of the registration numbers of the mates so that the corresponding records can be brought together if required.

Type of certification

See "Certifier".

Weight at birth or delivery

Uses of data

The International Statistical Classification of Diseases, Injuries, and Causes of Death[91] distinguishes, among diseases of the newborn, between those affecting infants who were premature and those who were not. The definition of "prematurity" on which this distinction is based is as follows:

> "For the purpose of the classification an immature infant is a liveborn infant with a birth weight of 5½ pounds (2,500 grams) or less, or specified as immature. In some countries, however, this criterion will not be applicable. If weight is not specified, a liveborn infant with a period of gestation of less than 37 weeks or specified as 'premature' may be considered as the equivalent of an immature infant for purposes of this classification."

One of the principal uses of birth weight with respect to a live birth is, therefore, to define prematurity for purposes of the "International Statistical Classification". This use would make it an essential item of information for countries using the "Classification" but, in addition, the World Health Organization Expert Group on Prematurity[92] recommended the definition of prematurity set forth above for all vital statistics. This recommendation of the Expert Group was thereafter noted by the World Health Assembly in resolution WHA3.39. Dependence of the definition of prematurity on weight at birth is thus firmly established, even though it is recognized as tentative pending collection and study of statistics on birth weight from different parts of the world. It is known that birth weight is dependent on nutritional and racial factors and, until the interrelationship of these and other factors is thoroughly understood, the definition of prematurity may be subject to revision.

From the analytical viewpoint, statistics of live birth by birth weight as well as by hospitalization and attendant are of great use in evaluating the need for

[88] *Ibid.* p. 16.
[89] *Ibid.* p. 22.
[90] Manual . . ., *op. cit.* p. 324.
[91] *Ibid.*
[92] World Health Organization, *Technical report series*, No. 27. p. 4.

medical services in the care of premature infants. On a residence basis, such statistics might reveal relationships between environmental factors and the incidence of prematurity, as well as geographic variations in prematurity of the liveborn.

The birth weight of a dead foetus is used primarily to provide data needed to arrive at a satisfactory definition of prematurity and to check on the accuracy of reporting of gestation period in order to obtain more precise statistics of foetal death. Cross-tabulation of birth weight with reputed gestation period reveals many values which appear to be underestimates of gestation period. For example, in a study carried out by Dr. Stocks,[93] the gestation period of a foetal death was reported as less than 28 weeks, whereas the birth weight was said to be more than 5½ pounds (2½ kg.). In such a case, it was assumed that the gestation period must have been an understatement and the foetal death was, therefore, classified as a late foetal death in spite of the short period of gestation.

The weights of dead foetuses at delivery are also used to study the relationship of complications of pregnancy among specified groups and their influence on foetal mortality.

International recommendations

The World Health Organization definition of prematurity given above makes use of weight at birth without further defining it or the manner in which it should be obtained, except to imply that, in classifying these data, there should be a distinction between birth weights above and below 2,500 grammes.

It was further recommended that the item be obtained for special study in connexion with foetal deaths.[94]

In accordance with these recommendations and recognizing the usefulness of the item despite the difficulties of obtaining data on it, the United Nations[95] recommended that weight at birth be included in the list of items to be obtained on statistical reports of live birth and foetal death as a second-priority item. It further recommended a definition which includes some instructions for the detail in which the item needs to be obtained. The recommended definition is as follows:

> "WEIGHT of a live-born child at birth or of a dead-born foetus at delivery should be the weight determined immediately after delivery, and should be expressed in grammes to a degree of significance which will allow a classification of 500-gramme intervals to be made."

The above recommendation suggests that countries with the facilities and also the *need* for birth-weight data should collect it. It recognizes that in many countries more emphasis still needs to be given to decreasing total infant mortality and, in these areas, it is assumed that special studies of prematurity as a cause of neo-natal mortality will await the elimination of those causes of infant death which are more susceptible to public-health action.

The United Nations Statistical Commission,[96] in defining "weight at birth", recommended that "weight . . . should be expressed in grammes to a degree of significance which will allow a classification of 500-gramme intervals to be made". To meet the requirement of the United Nations recommended definition, as well as that set forth in the international definition of prematurity (that a break in the classification come at 2,500 grammes), the following is suggested as a classification scheme. Should further consolidation be required for national purposes, convertibility to the standard should be maintained.

500 grammes or less	=	1 lb. 1 oz. or less
501 — 1,000 grammes	=	1 lb. 2 oz. — 2 lb. 3 oz.
1,001 — 1,500 grammes	=	2 lb. 4 oz. — 3 lb. 4 oz.
1,501 — 2,000 grammes	=	3 lb. 5 oz. — 4 lb. 6 oz.
2,001 — 2,500 grammes	=	4 lb. 7 oz. — 5 lb. 8 oz.
2,501 — 3,000 grammes	=	5 lb. 9 oz. — 6 lb. 9 oz.
3,001 — 3,500 grammes	=	6 lb. 10 oz. — 7 lb. 11 oz.
3,501 — 4,000 grammes	=	7 lb. 12 oz. — 8 lb. 13 oz.
4,001 — 4,500 grammes	=	8 lb. 14 oz. — 9 lb. 14 oz.
4,501 — 5,000 grammes	=	9 lb. 15 oz. — 11 lb. 0 oz.
5,001 grammes or more	=	11 lb. 1 oz. or more
Specified as premature (immature) but weight not stated		
Not stated		

The pound and ounce equivalents to the gramme intervals are given to facilitate conversion from avoirdupois to the metric system. Until all weights are recorded in grammes, the avoirdupois weights will need to be converted to the metric scale and a standard conversion table will aid in achieving desired comparability.

Problems of obtaining data

The difficulties of obtaining the weight of a live-born child or of a dead foetus at delivery are related to the proportion of such deliveries which take place in hospitals or with private medical attendance. Although hospitals may fail to record weight in every instance, it may be said that, in general, the reporting of weight at birth or delivery would be more complete and accurate in respect of deliveries taking place in hospitals than for others. Actually, this item of information is one which will not usually be reported except by a midwife, a nurse, or a doctor. Even in hospitals, the weights of very small infants, especially those who die soon after birth, are often not recorded. Because of all these reasons, there will normally be a large number of reports with birth weight "unknown". The distortion caused by this category in the distribution can be alleviated to some degree by distributing the unknown frequencies among the "knowns", but, in the last analysis, the only real solution to the problem is the achieving of complete reporting, at least from hospitals and medical attendants.

[93] *Report on the Definition of Stillbirth and Abortion*, by Percy Stocks. World Health Organization document No. WHO/HS/STDEF/4, 14 February 1950. p. 8.

[94] Resolution No. 1 of the Subcommittee on the Definition of Stillbirth and Abortion at its first session 27 February to 3 March 1950 (World Health Organization, *Technical report series*, No. 25. p. 16.)

[95] *Principles for a Vital Statistics System, op. cit.* p. 12, 16.

[96] *Ibid.* p. 16.

CHAPTER XI

COMPILATION—STATISTICAL PROCESSING

In previous chapters, the vital-statistics reports were discussed from the viewpoint of reporting, that is, in terms of the registrar as a receiver of information from the informant and as a transmitter of reports to the statistical authorities. The extent and type of data obtained and reported was examined, and pertinent international recommendations with respect to content and definitions were set forth. This chapter deals with the other part of the process, i.e., with the types of reports received in the office which is responsible for producing national vital statistics, and the procedures involved in compilation, i.e., editing, querying, coding, punching, classifying, tabulating, posting, error control, computation, and presentation.

A. Type of statistical report received at national level

It has been shown previously that the statistical reports prepared by the registrar and sent out from his office may be of three types, "individual", "list", and "summary". As reporting devices, the merits of each of these have been discussed in chapter VIII. The merits of each type of report will be discussed here in terms of compiling national vital statistics, that is, the advantages and disadvantages which each has in terms of coding, classifying, and tabulating. But, in so doing, another factor must be considered. This additional factor is the type of compilation, that is, whether compilation of national vital statistics is performed on a centralized basis by a national agency or whether compilation is decentralized georgaphically.

1. INTERNATIONAL RECOMMENDATION

The United Nations has recommended[1] that national vital statistics be compiled centrally and that this compilation be performed in such a way as to result in uniformity and flexibility. The pertinent Principle is given below:

"405. *National compilation from individual statistical reports*

"(*a*) National vital statistics should be compiled in such a way as to obtain uniformity of classification and tabulation and to permit flexibility and adaptability in tabulation to meet national and international requirements.

"(*b*) Experience has shown that the procedure best adapted to produce the highest degree of accuracy, uniformity, and flexibility is centralized compilation from individual reports which contain full information necessary for statistical purposes . . ."

For a number of reasons which will be discussed in detail below, national vital statistics assembled from returns summarized at subnational levels generally tend to approach in quantity, quality, and timeliness the level of the poorest of the component parts. National vital statistics of this type, assembled from independent summaries which have originated in a multiplicity of areas, can rarely be uniform in reliability or accuracy and are likely to be seriously limited in detail and in timeliness. They may lack internal consistency and, if the method of their compilation is known to the user, they seldom inspire confidence. The principle of centralized compilation from unsummarized data, on the other hand, is based on its known advantages in terms of the applicability of uniform standards of editing, coding, and classifying, and the increased flexibility and richness of the tabulation programme under these conditions.

2. NATIONAL PRACTICE

The great majority of the countries report that national vital statistics are compiled centrally from either individual or list reports. Those which report the use of the summary-type statistical report for compilation of either live-birth, death, stillbirth, marriage, or divorce statistics are set forth in the tabulation below:

[1] *Principles for a Vital Statistics System; Recommendations for the Improvement and Standardization of Vital Statistics.* United Nations. Statistical Office. Document ST/STAT/SER. M/19, 26 August 1953. p. 18. (Sales No. 1953.XVII.8)

Table D. Countries which use summary statistical report for compilation of vital statistics

	Live birth	*Death*	*Stillbirth*	*Marriage*	*Divorce*
Australia	List	List	—	List	Summary
Belgium	Individual	Summary	Summary	Individual	Summary
Burma	Summary	Summary	Summary	—	—
Canada	Individual	Individual	Individual	Individual	Summary
Ceylon	List	List	List	List and summary	List
German Federal Republic	Summary	Summary	Summary	Summary	Summary
Haiti	List	List	List and summary	—	—
India	Summary	Summary	Summary	—	—

(*Continued on following page*)

Table D. Countries which use summary statistical report for compilation of vital statistics *(concluded)*

	Live birth	*Death*	*Stillbirth*	*Marriage*	*Divorce*
Lebanon	Summary	Summary	—	Summary	Summary
Liechtenstein	Summary	Summary	Summary	Summary	...
Pakistan	Summary	Summary	Summary	—	—
Scotland	Individual and list	Individual and list	Individual and list	Individual	Summary
Spain	Summary	Summary	Summary	Summary	—
Syria	Summary	Summary	—	Summary	Summary
Thailand	Summary	Summary	Summary	Individual	Individual
Turkey	Individual and summary	Individual and summary	—	Individual	Individual
United States	Individual	Individual	Individual	Summary	Summary
Yugoslavia	Summary	Summary	Summary	Summary	Summary

Only nine countries report the use of the summary type of report for compiling national statistics on all events; these are the German Federal Republic, Spain, Liechtenstein, Yugoslavia, Burma, India, Pakistan, Lebanon, and Syria.[2] In Lebanon, Syria, and Liechtenstein, the local (communal) registrar is responsible for preparation of a monthly summary. In India and Burma, the original compilation is made at the district level, after which a series of consolidations follows from the state or provincial levels to the national. In the German Federal Republic, Spain, and Yugoslavia, the "Land", "Provincial", or "Peoples State" statistical office — as the case may be — prepares the tables and passes them to the national office.

In addition to the nine countries which routinely compile all national vital statistics by consolidation of data from summaries prepared at subnational levels, several other countries use this type of report for selected events. The United States, for example, compiles marriage and divorce statistics from "pre-tabulated" data; Canada, Australia, and Scotland assemble divorce statistics from summaries; Thailand compiles live-birth, death, and stillbirth statistics from summaries, although the individual reports are also collected nationally. Ceylon uses the summary type report for Kandyan marriages.

(a) *Disadvantages of summary statistical reports*

Review of experience in various countries has shown that from a statistical and practical point of view, the "pre-tabulated" or summary report has many disadvantages for the compilation of national vital statistics. This system is often urged as a more economical method of operation by which a regional office obtains statistics for its own needs and, at the same time, produces one segment of the national figures which only needs to be assembled, together with the other segments, to produce national statistics. But the decentralized type of operation performed by independent agencies has numerous limitations, one of which is that the tabulations produced are invariably restricted in scope.

Limited scope of the data. In chapter IX there were set forth in tables 13 to 17 all the items of information which are made available at the national level for the compilation of statistics on each of the five vital events. Reference to those tables will show the paucity of items which appear for seven[3] of the nine countries which use pre-tabulated summaries for national compilation. For example, in none of these seven countries are there more than 14 items on the statistical report of live birth, while the median number of items collected by list or individual reports is 19. The country with 14 items is Yugoslavia. Liechtenstein has 12, the German Federal Republic 11, Spain 7, Burma 6, Syria 5, and Lebanon 4. To analyse the extent of the deficiency, forms for the German Federal Republic may be taken as an example. The items on the statistical report of live birth for Bremen may be compared with those which finally appear in the tables which each *Land* office prepares for the Federal Statistical Office. The comparison is given below:

[2] France, in addition, employs a somewhat similar system in which the national statistical authorities operate in regional branches administered by the national office and, therefore, not decentralized in the sense used here.

[3] National statistical report forms are not available for Pakistan or India.

Individual report used in Bremen	*Summary report used at national level*
CHARACTERISTICS OF INFANT	
Birth registration number	Date of birth
Date of birth	Date of registration
Date of registration	Legitimacy
Legitimacy	Place of registration
Name	Sex
Place of birth (geographic)	Type of birth
Hospitalization	
Place of registration	
Sex	
Type of birth	
CHARACTERISTICS OF MOTHER	
Citizenship (if child illegitimate)	Date of birth
Date of birth	Date of marriage
Date of marriage (if child legitimate)	Number of children born
Displaced persons status (if child illegitimate)	Place of residence
Last permanent residence	
Industry	
Marital status	
Number of children born	
Occupation	
Permanent residence on 1 September 1939 (if child illegitimate)	
Place of residence	
Religion	
Status	
CHARACTERISTICS OF FATHER	
Citizenship	Occupation
Displaced persons status	
Last permanent residence	
Industry	
Occupation	
Permanent residence on 1 September 1939	
Religion	
Status	

Even in this country which provides for collection of 11 items of information, the relative sterility of the national data compiled from "tables" is readily seen. Similar comparisons for other events and for other countries will show that, in every case where decentralized compilation is in operation, the scope of national vital statistics is limited. Many of the items of information originally collected from the informant are not used and, therefore, the system suffers from a fundamental defect in the statistical sense. It would, of course, be possible to arrange for detailed tabulations, utilizing all available items of information, to be made at the subnational levels. But such tabulations are usually not useful on a small geographic-area basis; primarily, they are more meaningful on a national basis and it would be manifestly uneconomical to require them to be made locally. This lack of balance between types of items collected and their most efficient use is an intrinsic defect of the decentralized system of statistical compilation.

Inflexibility. A related deficiency in the system of "pre-tabulated" data is the inflexibility of the tabulations. In order that a subnational office in this system may plan its tabulation programme, it must be advised of the requirements of the national office well in advance. This means that plans for the use of data must be fixed long before the data are available, and before the current needs are known. Since under geographically decentralized compilation there is no control over the basic statistical reports, there is little likelihood that, after plans are once fixed, additional or more detailed tabulations could be introduced to meet special needs which might arise. For the same reason, modifications in the tabulation programme to meet changing national conditions become difficult. This is so because, to effect such modifications there must be unanimous agreement among all independent contributing segments and some of the subnational units may not be appreciative of national needs, especially when to meet such needs a change of established routine is required. Future use of untabulated data too is contingent upon the agreement of these same subnational offices. Decentralized control of compilation, therefore, tends to make the tabulation programme rigid and inflexible as well as relatively sterile.

Delay in preparing national statistics. Despite the fact that decentralized compilation is often described as a time and money saver, in actual fact it may delay the production of national data. This is so because such production is dependent not on the initiative and activities of one office but upon those of a number of separate and relatively unrelated organizations. Tabulations in any one of the subnational units may be delayed by a number of factors; until each constituent unit has completed its particular segment in the form of the standard tabulations, and transmitted them to the central point, national statistics cannot be assembled. National tabulations, therefore, become depend-

ent not upon the general level of efficiency, but upon the efficiency of the unit which is the weakest from a technical and administrative viewpoint. Lack of control over production schedules is one of the worst deficiencies of the decentralized system.

Lack of control over completeness and accuracy. Among the procedures which will be mentioned below as essential to the processing of statistical reports are the control of receipt to ensure completeness of reporting, and the critical examination of reports for completeness and consistency of data combined with the necessary querying programme for data improvement.

When national statistics are assembled from pretabulated summaries, the national office must rely on the subnational offices to administer the receipt of individual reports. It is quite likely that each office will have different standards with respect to control. The national office may exert some measure of influence by comparing total returns from month to month, but in case of gross numerical deficiencies, the only recourse is to call to the attention of the subnational reporting unit the possibility of incomplete reporting. At this stage, the tabulation programme may be too far advanced for correction without excessive delay and expense.

Inability of the central office to query individual reports for completeness or consistency of data is another handicap when compilation is decentralized. The quality of the reported data will be a product of the efficiency of the registrar who reported it and of the personnel in the regional offices who should review it and obtain the necessary clarification or additional data. The extent and nature of the preliminary review will tend to differ from province to province. If there is no opportunity for central review and query, the effect of this perhaps spotty and non-uniform approach to improving the accuracy and completeness of the data will be to decrease the over-all quality of the national statistics. This is especially true with respect to cause-of-death statistics. Centralized compilation of all demographic statistics, and especially of cause of death, has been advocated internationally as far back as 1925,[4] not only because of the advantages which will accrue with respect to coding but also for the purpose of querying terms of doubtful significance. There is no guarantee that a uniform programme of querying will be carried out effectively by a number of geographically decentralized offices or, in fact, that any programme will be undertaken.

Lack of control over reporting from the original source may also result in lack of uniformity in respect of the "cut-off date" used for tabulations. One subnational area may include in its compilations all events received up to a certain date, while another — either deliberately or unknowingly — may operate according to another date. Such differences may make for incompleteness of data on the one hand, lack of comparability between data for separate geographic areas on the other, and delay in preparing national consolidations.

Lack of uniformity in coding and classifying. Lack of uniformity in coding and classifying which must result when these operations are performed on a geographically decentralized basis is another disadvantage of compiling national vital statistics from summarized returns. Before they can be classified, many of the items of information on the vital-statistics reports require coding. Although numerous examples could be given, attention will be directed to only three items: the "number of children born to this mother" which must be converted by means of a code into the type of birth order required, i.e., live-birth order, total birth order, etc.; "cause of death" which must be selected from the causes given and translated into a number; and "occupation" which must be coded uniformly. In order to be uniform, the coding of any one of these three items and, especially that of cause of death, must be done centrally, under one set of rules and under systematic interpretation of those rules. The proper selection of the cause of death to be coded and classified as the "underlying cause" is subject to many rules laid down by the World Health Organization.[5] In practice, additional working rules and decisions become necessary. If the World Health Organization rules are interpreted independently by a number of separate offices, and a corresponding number of additional "working" decisions are developed, the result cannot be nationally uniform.

In theory, it is possible to envision instructions and rules of procedure which would unify and standardize the application of any code. However, even in very advanced statistical services, there is evidence that geographically decentralized procedures carried out under identical instructions may fail to result in comparable data. It may be contended that discussions and training would eliminate discrepancies to a large degree, but this result could not be taken for granted. It would necessitate a system of continuous control and evaluation which, in terms of cost, would most likely be greater than the centralized processing.

(b) *Advantages of individual over list-type reports in compiling vital statistics*

Amount of data included. The international recommendation on type of statistical report given above states that the method best adapted to producing the highest degree of accuracy, uniformity, and flexibility is centralized compilation from individual reports which contain full information necessary for statistical purposes. In the discussion (chapter VIII) of the relative merits of the "individual" versus the "list" reports, it was emphasized that the individual or single-unit report tends to provide more adequate space for the recording of information than does the multi-unit type. In contrast to collective lists, which usually require condensation of data, individual reports supply either the original response or a facsimile of it, with all pertinent detail — data which can then be interpreted uniformly according to standard rules. This consideration

[4] Conferences of League of Nations, held in Geneva, 21-27 August 1925.

[5] Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death; 6th revision of the International Lists of Diseases and Causes of Death adopted 1948, vol. 1 (World Health Organization, *Bulletin,* Supplement 1) Geneva, 1948. p. 345-352. Also, Supplementary Interpretations and Instructions for Coding Causes of Death; Addendum 1 to the Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death. (World Health Organization, *Bulletin,* Supplement 6) Geneva, 1953.

is important in relation to all vital-statistics data, but it is especially significant with respect to cause-of-death information.

Ease of processing. In addition to its advantages with respect to the amount and type of data made available in manageable form, the individual form has certain practical advantages in processing. If hand-sorting is employed, individual reports may be handled as sorting units; data from multi-unit reports must be classified and tabulated by the tally method which is both inefficient and difficult to verify. Manual compilation using individual forms may be further simplified by using different colours for the paper on which the reports are printed in order to facilitate basic sorts, as for example those for sex or legitimacy. Even when classifying and tabulating are done by mechanical means, the individual form usually has an advantage in terms of space. As a rule, the space limitations of the list-type report make it difficult to provide for codes, inasmuch as there may be as many as 25 events on one page, each of which may involve separate codes.

B. Statistical processing procedures

1. Advance planning

One of the fundamental principles which should guide statistical investigations is that of advanced planning. The raw data and the form in which they are obtained determine the extent and nature of the statistics which can be compiled from the data. The final statistics can be no better, in terms of completeness and accuracy, than the original reports, notwithstanding the manipulations through which they may go or the indices which may be derived from them. It is imperative, therefore, that early decisions be made as to what vital statistics may be required, and which of these needs may or should be filled under the existing budget and facilities of the office responsible for processing. The needs can be expressed in the form of tabulations — with elements clearly defined — and from this end point, the technician must work backward to translate these needs into tabulation plans, editing procedures, codes, and finally into reporting instructions for the registrar.

The formulation of the plan will need to take into consideration several factors: (1) the period of time required to plan and execute a statistical programme; (2) the needs of consumers and how these may be met; and (3) the special, more detailed or modified tabulations required to take advantage of population data available only at or near the date of the census of population.

The planning and execution of the annual statistical programme includes many steps, chief of which are the preparation and distribution of appropriate instructions to the registrars; the scheduling of the collection, editing, coding, classifying, and tabulating of data; the provision for analysis of the results; the planning and preparation of a report on the investigation; and finally the issuance of appropriate publications. The work programme in the statistical office proceeds continuously and may be concerned at any one time with the vital statistics of at least three different years. The need for long-range careful planning to delineate the objectives of each project, and the requirement that these plans be crystallized early into a clear programme of work, are self-evident.

The needs of the consumers and how they can be fulfilled is a major consideration, although the manner and extent to which these needs are met will be determined by various practical factors.

The necessity of expanding or modifying the vital-statistics programme at times when census returns, for example, are available, is another factor to be considered. In order to take advantage of these detailed data, plans must be made several years in advance of their availability; a rough outline of the vital-statistics programme for five or ten years in advance would be useful in this connexion.

The extent to which the vital-statistics programme could be achieved by the regular annual tabulations, by sample tabulations, or by special surveys should be studied, because in this connexion not only adequate advance technical planning but also budgetary provisions will need to be considered.

(a) *Sampling*

To meet the needs of the vital-statistics system in the most efficient and economical manner, the administrator should consider the applicability of sampling methods for certain specific purposes.

International recommendation. The possibility that sampling procedures might find a place in the vital-statistics system was recognized by the United Nations in the *Principles for a Vital Statistics System,*[6] but only in the sense of suggesting that its applications to various problems be "explored". The limitations of sampling, except in so far as it may supplement routine compilation, were also recognized in the Principle which follows:

"107. *Place of sampling in the vital statistics system*

"The place of sampling in vital statistics procedures should be explored with a view to determining its applicability to quality control throughout the system, and to special surveys. It is evident that sampling is not applicable to legal registration, because every vital event which occurs among the population should be registered for legal purposes. However, where a complete registration system is not practicable or sufficiently reliable, the possibility of applying sampling methods to the reporting, collection and compilation phases should be explored, keeping in mind its limitations in providing the desired detail, and the requirement that sampling be carried out only under rigorous scientific specifications."

For vital statistics, the sampling method has its most effective application in studies to evaluate and control the quality of the final tabulations, in obtaining preliminary results earlier than they would otherwise be obtained, and in making certain tabulations for which it is not necessary to use all the reports. The application of sampling for obtaining preliminary results in advance of the regular tabulation may be illustrated by the procedure adopted in the United States of America where a 10 per cent sample of deaths is systematically selected by each state, transcribed, and forwarded in advance of the regular reports of deaths which occurred in the month. Immediately upon receipt, at the national level, this sample of deaths is coded, tabulated,

[6] *Principles for a Vital Statistics System, op. cit.* p. 5.

and analysed, especially with respect to selected causes of death. Provisional national mortality data are thus supplied far in advance of the regular tabulations.

An example of the use of sampling in vital statistics to obtain data not otherwise available is found in Sweden, where a "sample" register for vital statistics has been established. The sample, which includes all births occurring on the 15th day of each month, covers about 3 per cent of the population. It is intended that this register will supply not only information on demographic changes, but also details of family statistics combined with income distribution, and the like; complex tabulations of this type can be obtained more economically from a sample.

These uses of sampling in vital statistics are not intended to take the place of the regular tabulations by which the aggregates, geographic distributions, and so forth, are obtained, but merely to supplement them. Sampling methods cannot be used economically to supply details for small geographic units or for distributions with small frequencies resulting from cross-tabulation of items. They fail, for example, to give an adequate mortality-by-cause picture especially for causes of death which have a high degree of medical interest even though not causes of greatest frequency.

(b) *Surveys*

The planning of the vital-statistics programme may need to take account also of the place of special surveys in the system. Special data such as medical information on foetal deaths might be collected only from hospital records rather than through the civil register. Reports of late foetal deaths or of neo-natal mortality might periodically be traced back to the mother, with the intent of obtaining additional information which might throw light on the problems involved, especially on the causes of foetal death.

The possibilities of such surveys are endless, but a limitation is usually encountered in the scarcity of staff able to undertake this type of activity, in the training of such staff, and in financing the interviews which are never accomplished quickly, involving — as they do — locating the informant, gaining an interview, and asking with care relatively complicated questions.

International recommendation. The difficulties enumerated above decrease the potential usefulness of special surveys in connexion with vital statistics. It is recommended, therefore, that they be undertaken only after careful analysis of the situation and always in conjunction with the conventional registration system, never as a substitute. This recommendation took the form of a United Nations Principle[7] which reads as follows:

"108. *Place of special surveys in the vital statistics system*

"The value of special or census surveys in conjunction with the conventional system of vital statistics should be recognized as a means of gathering facts which cannot be collected so efficiently by routine comprehensive statistical reporting, or those which are required only at such widely separated intervals of time that it is inadvisable to include them as regularly reportable items of information for statistical purposes."

[7] *Ibid.* p. 5.

2. Control of receipt of reports

Once the over-all plans are made, the next major concern of the statistical office begins when the reports prepared by the registrar start to be received.

(a) *International recommendation*

So important is the control procedure involved that an international recommendation on this point has been put forward in Principle 304.[8] The Principle is quoted below:

"304. *Control of receipt of statistical reports*

"(*a*) Every possible administrative procedure should be employed for controlling the prompt receipt, by the central vital statistical office, of statistical reports from every reporting area, with the object of making possible current tabulations which will be adequate in terms of completeness of geographic and ethnic coverage, timeliness and detail . . .

"(*b*) A strict time schedule should be established, taking into account the characteristics of the country in terms of topography, communications, and so forth, as well as the provisions for channelling original reports or copies thereof to intermediate offices."

The establishment of a strict reporting-period schedule is an essential factor in the maintenance of the current statistics programme. Many factors must be considered in establishing the schedule. It must take into account the number of channels through which the reports will have to pass from the local to the national level, and the procedures which the reports must undergo en route. It must consider the type of communication and transportation available throughout the country and the effect of seasonal climatic changes on these channels. These and other factors will determine the reporting schedule.

Once the schedule is established, the receiving office must diligently control the receipt of reports. Control must be exercised both for promptness and for completeness of reporting. Not only must reports be received on time, but care must be exercised to see that returns are received from every geographic reporting unit, and that the frequencies reported are consistent with those reported during preceding equivalent reporting periods.

The specific method devised for controlling receipt will vary according to conditions, but a chart approach is often helpful. Such a chart might show for each reporting unit the volume of previous reporting, the expected and actual date of receipt, and the number of reports received. The status of each reporting unit would thus be visible at a glance, with delinquent areas easily distinguishable. Such a comparative device might also have a stimulating effect on delinquent registrars if the situation were brought to their attention.

The importance of this control step cannot be overemphasized. Upon it depend the quality of the resulting statistics and the validity of the rates computed from the statistics. Failure to control the number and geographic distribution of reports received may undermine the entire vital-statistics system. The follow-up procedures which normally should be employed to obtain adherence to reporting requirements are among the most important administrative duties of the col-

[8] *Ibid.* p. 10.

lecting agency, and they form an integral part of the development of an adequate vital-statistics programme.

3. Critical examination ("editing") and query programme

After reports have been received and their aggregate number compared for control purposes with former receipts, a critical examination of each report should be undertaken. Close scrutiny or "editing" of the reports has as its ultimate object the improvement of data reporting, by questioning inconsistent, inappropriate, or obscure answers, and by requesting information where none has been given on the reports. This process of repeated questioning is known as "querying". In many instances, the new information received may substantially improve the statistical results. In other instances where the quality of reporting is already high, the additional information received as a result of these activities may not materially improve the statistics, since these additions to the data might not be significant. In such instances, the important objective is to educate the informant and to promote better reporting so that the quality of the future statistics will be maintained and improved.

(a) *International recommendation*

To underline the importance of this method of improving statistics, the United Nations has recommended that "querying" be adopted as a principle of the vital-statistics system. The Principle[9] which includes this recommendation is 306 (*a*), which reads as follows:

"306. *Improvement of completeness and accuracy of data reported for statistical purposes*

"(*a*) An appropriate continuous querying procedure should be established and maintained with respect to all data which are collected for statistical purposes — and in particular with respect to terms of doubtful significance used in reporting causes of death — with the purpose of clarifying the facts concerning the event and of educating the informant and the recording agent regarding reporting requirements, in order that the resulting statistics may be improved."

The importance of being in a position to query items of information has been stressed in a previous discussion (p. 38). Assuming that the appropriate organizational pattern for compilation of statistics has been established, then querying procedures should be a routine administrative function, set up on a comprehensive or sampling basis, according to the needs of individual countries and the problem areas within countries. It may be expedient and possible for most, if not all, of these queries to take place below the national level, but the important point is that provision be made for a critical central review and that steps be taken to improve reporting by educational and promotional activities.

The World Health Organization has also recognized the paramount importance of querying terms of doubtful significance reported as causes of death. When the reported cause is in terms which are not acceptable as a cause of death (as, for example, when a symptom rather than a cause is given), when there is an omission of data, or where the evaluation of the reported sequence of direct and antecedent causes reveals discrepancies, then a query to the certifying physician is the only feasible procedure. The use of unsatisfactory terminology, and carelessness in completing the medical certificate of death, can only be corrected by constant vigilance.

To guide countries in querying cause of death, the World Health Organization has recently issued Amplification of Medical Certification of Cause of Death: inquiries to certifiers concerning incomplete or vague statements,[10] which sets forth general guides to terms requiring further investigation as well as a review of the experience of England and Wales and the Netherlands in this field.

A good example of the success to be obtained from query programmes, even when they are of an *ad hoc* type, is given in *The Registrar*.[11] The United States National Office of Vital Statistics has been making plans to study mortality by occupation, using returns for 1950, the year of the population census. The first phase of the project was to study and evaluate the replies being received on this item.[12] The reports for April 1950 were, therefore, carefully reviewed to see if the entry for occupation and industry on death statistical reports for males 15-64 years of age were classifiable according to the 1950 codes of the Bureau of the Census. A total of 28,685 death reports were reviewed. Of these, 4.6 per cent lacked a classifiable entry for occupation and industry. Of the occupation entries alone, 5.9 per cent were not classifiable; of the industry items, 12.7 per cent were not classifiable.

These results were better than expected but, none the less, a query programme was considered necessary for at least the poorest returns. Accordingly, with the co-operation of 14 areas, plans were made to query the informant or the funeral director.

The results of the query programme were very good. Of 18,210 queries mailed to the 14 states, 10,056 or 55.2 per cent were returned with additional information demonstrating that it is possible to improve even difficult items such as occupation and industry on death statistical reports. The success achieved on these items illustrates the principle of querying in relation to complex information.

4. Coding

When, within reasonable limits, the items of information on the statistical report are considered to be as complete and accurate as possible, the reports then pass to the processing operations, first of which is coding. Coding is the translation of an item of information into numerical terms for ease in classifying. Some items of information, such as age, are reported in numerical form. These are already "coded" in the sense

[9] *Ibid.* p. 10.

[10] Amplification of Medical Certification of Cause of Death; inquiries to certifiers concerning incomplete or vague statements. (World Health Organization, *Bulletin*, Supplement 5) Geneva, 1953.

[11] "Query Program for Occupation and Industry". *The Registrar*. Federal Security Agency. Public Health Service. National Office of Vital Statistics. Washington, Vol. 17, No. 10, 15 October 1952. p. 38.

[12] "Evaluation Study of Occupation Items". *The Registrar*. Federal Security Agency. Public Health Service. National Office of Vital Statistics. Washington, Vol. 16, No. 1, 15 January 1951. p. 1, 4.

that it would be a simple matter to sort all reports having the same age into one group. No interpretation would be required. Theoretically, it would be just as simple to sort all identical causes of death into one group, but actually such a procedure is not possible because the same causes of death may be expressed in different words, and a certain amount of interpretation is required. Likewise, the report on "attendant at birth" and "certifier of a death" may require interpretation. When "date of birth" is given instead of "age", the age of mother at birth of child, the age at death or at marriage, must be calculated before that report can be grouped with others by age. Experience has shown that these interpretive functions are best done in one step, a step which is completed before sorting or classifying is begun.

In the discussion of the advantages of centralized over decentralized compilation, it was pointed out that the ability to provide for centralized coding was an important factor. Since coding is an interpretive function, consistency of coding depends on uniform procedures and rules of selection. These rules, adapting special cases to standard codes, must be administered centrally if the coding is to be consistent and systematic.

Written instructions including the classifications to be used and the definitions involved are of utmost importance in obtaining consistency in coding. Dependence on memory is inadequate at best, but with frequent changes of personnel, it is impossible. Preservation of written instructions and the decisions made in applying these instructions produces not only the possibility of consistent application of codes but provides a training manual for new employees.

The codes to be used for occupation, cause of death, birth order, and so forth, are determined in accordance with the classifications required, and they are set forth in the work specifications for each office. However, the need for increased international comparability has led to the development of international standard codes and classifications, which have been described in detail in chapter X.

5. Punching or transcribing

This is the process by which the codes are transcribed either manually or mechanically to a statistical slip (sorting card) or punch card which will be the unit for subsequent classification and tabulation.

Manual transcription is used when machine tabulation equipment is not available, or when it is not possible to utilize the statistical form itself as a sorting card as, for example, when data are reported on multi-unit lists rather than on individual reports. In such cases, one may write the pertinent information or codes in pre-determined order on a printed form which can then be sorted by hand into different classes or categories.

Mechanical transcription consists of perforating a card by a hole whose pre-determined position on the card identifies the characteristic involved. Some punch cards have place for perforation around the margin only, while others have as many as 80 or 90 columns of 12 positions each.[13]

Whether the manual or mechanical means of transcription is used, the arrangement of fields of data on the sorting or punch card should be in the same order as the corresponding data on the statistical report from which it is taken. Correspondence in the order of the items will aid in correct and rapid transcription or punching.

6. Classifying

Classification may be defined as the systematic arrangement (sorting) of units into the established mutually exclusive categories or classes of a definite classification scheme, designed for a specific characteristic of the unit.

This definition reveals the principles which underlie the process of classification. First, it will be obvious that classification is not an obscure procedure — nor one applicable to statistics alone. Classification is simply sorting of individuals or things into separate groups according to some characteristic of the individual or thing. It is the first step in putting a mass of observations into order, that is, into a systematic form which is more easily expressed and comprehended. As A. Bradford Hill[14] puts it, "In dealing with a series of observations the first object must be to express them in some simple form which will permit, directly or by means of further calculations, conclusions to be drawn."

(a) *Types of classifications*

Sorting or classifying may be carried out with respect to any characteristic of the individual or thing, but the type of characteristic for which it is designed determines whether the classification is "qualitative" or "quantitative". Qualitative classifications, also known as "attribute" classifications, are those which are based on an identifying characteristic which is a quality of the observation. Characteristics which are qualitative in this sense are sex, marital status, legitimacy, literacy, religion, cause of death, and the like, all of which constitute qualities of the thing observed at the moment of observation. A classification based on these characteristics is a qualitative one. The number of observations which fall into the classes of a qualitative classification measure the frequency of this particular characteristic with respect to the observations under study.

The second type of classification is the "quantitative" or "measurement" type which unlike the qualitative classification consists of classes or categories all of which relate to the same characteristic and which together provide a scale of measurement for that characteristic. Quantitative classifications result when such characteristics as age, chronologic time periods, periods of gestation, weight at birth, duration of marriage, and so forth, are the basis for classification.

(b) *Characteristics of a good classification scheme*

Meeting needs of investigation. The structure of the classification scheme for any characteristic should be decided upon during the planning of the project so that it will meet the needs of the investigation. This fundamental attribute of a good classification scheme was discussed at the International Seminar on Statistical

[13] See special trade publications and *Handbook of Statistical Organization*. United Nations. Statistical Office. Document ST/STAT/SER.F/6, December 1954. Chapter VII. (Sales No. 1954.XVII.7)

[14] *Principles of Medical Statistics* by A. Bradford Hill. The Lancet Limited, London, 1937. p. 19.

Organization where it was noted[15] that, "The categories established for classification of responses to particular survey questions should be coordinate with the over-all objectives of the survey. Much may often be saved in coding and in machine processing if the coding systems accurately represent the arrangements and breakdowns of variables desired for analysis. Where the categories in the coding system represent a more detailed breakdown of variables than is required for analysis of the data, additional steps may be required in consolidating the breakdowns; where the categories in the coding system are not detailed enough, the value of the data is very often irreparably impaired."

The decision as to the scheme required will need to be made on the basis of the objectives of the study, but in the case of vital statistics, it must also take account of the classification schemes used in the field of population statistics. To achieve comparability, the classification schemes chosen for the various attributes of vital events must be consistent with those used for related attributes and for population statistics. The advantages of adopting internationally standard classification schemes will be discussed below.

Separate schemes of mutually exclusive categories. Another qualification of an adequate classification scheme is that it be designed for one characteristic only. Attempts to provide for the classification of two or more items in one scheme usually result in confusion and in unnecessary complication of the coding and tabulating processes. The individual categories of a good classification scheme should be mutually exclusive. The limits of the classes should be set forth clearly and unambiguously, with no possible overlapping, so that the attribute of each event may be classified easily in one and only one category of the classification.

All-inclusive coverage. The categories of the classification should together cover the universe of observations being classified. Since it is almost inevitable that there will be some observations for which the characteristic is unknown, care should be taken to provide for a "not-stated" category. The sum of the frequencies in all categories should equal the total number of observations.

Adaptability to standard classification schemes. International standard classification schemes have been developed for several attributes, and conventionally accepted schemes have been suggested in other cases.[16] "Age" classifications, for example, usually provide a separate category for the first year of life, followed by 5- or 10-year age groupings, and an open-end terminal group at 75 or 85 years of age; the "not-stated" or unknown group completes the scheme. A classification of marital status requires a small number of relatively well-defined categories, among which "single", "married", "widowed" and "divorced" may always be found. "Cause-of-death" classification has been the subject of international recommendation for almost 100 years, the first such classification being based on the site of the disease, that is, the anatomical parts of the body involved, and the recent classifications being based to a larger extent on the etiology of the disease.

The change in the fundamental structure of the international classification of diseases, injuries, and causes of death from an anatomical to an etiological base reflects precisely the concept of planning and usefulness in relation to a classification scheme. It may readily be seen that from the viewpoint of preventive medicine and public health, causes of death tabulated according to the part of the body affected would appear to have limited use. If public health needs were to be met, it was necessary that the *causative agent* be brought to light and, for this reason, infectious and parasitic diseases needed to be classified separately; diseases connected with nutrition, with poisons, etc., needed to be isolated. The current International Statistical Classification of Diseases, Injuries, and Causes of Death[17] is designed to bring together causes of death which have similar origins and, hence, presumably related preventive or curative measures.

"Occupation" and "industry" are two other attributes which have been the focus of international recommendations. Basic definitions for these two items are still not completely comparable from country to country, but some attempt has been made to standardize the system of classification in such a way that the results will be more meaningful.[18]

7. Tabulating

Classification has been defined as sorting of units into categories or classes. Tabulation is the counting of units in each category of a specific classification scheme and the summing up of the frequencies in the classes.

A tabulation programme, like a classification scheme, is a reflection of the objectives of the statistical investigation — expressed in terms of desired classifications of data. The description of a tabulation, however, is not a simple task. It requires enough words to identify the type of data being classified, the geographic basis of tabulation, the time reference, the characteristics or attributes being classified, and whether they are being cross-classified one with another. Because of the comprehensive requirements of the description and the number of words necessary to express it, there is need of a shorter form which would condense the pertinent facts to usable proportions and make them more readily understandable and comparable one with the other. To meet this need, a "formula" approach is often useful.

(a) *Descriptive formula*

The development of a "formula" or algebraic approach to description of tabulations has been the focus of attention for many years. A paper entitled "The

[15] *General Notes on Statistical Organization: Codes and Coding Techniques in the Punched Card Method,* prepared by Sidney Binder, National Office of Vital Statistics, United States. (International Seminar on Statistical Organization, sponsored by the Government of Canada and the United Nations, 13-31 October 1952, Ottawa, Canada. Paper Number 8.3.)

[16] See chapter X.

[17] Manual . . ., *op. cit.*

[18] *Record of the Eighth International Conference of Labour Statisticians.* International Labour Office. Document G.B.128/3/1, Geneva, 1-4 March 1955; *International Standard Industrial Classification of all Economic Activities.* United Nations. Statistical Office. Document ST/STAT/SER.M/4, Lake Success, 31 October 1949. 31 p.

Need of an Index Statisticus",[19] published in 1933, described a system of symbols by which tabulations could be readily identified and indexed. A similar idea was developed later by the National Office of Vital Statistics in the United States of America for the purpose of analysing the national tabulation programme to assure the efficient use of mechanical equipment; France too employs a system of symbol notation to describe tabulations.

In general, the formula method consists of assigning symbols instead of words to the various aspects of the narrative description of a tabulation and of separating groups of these symbols in "fields" delimited by brackets. An example will illustrate the method, which may be modified for various types of problems.

Assume it is desired to describe a tabulation of live births by age of mother, legitimacy, and attendant at birth in the 30 provinces and 15 principal cities of country X during 1955. To translate this description into the "formula" style requires that five separate "fields" of symbols be set up, separated one from the other by brackets. Reading from left to right, the first field will give the symbol which identifies the type of data or the event being sorted and tabulated, i.e., births, deaths, marriages, etc. In the second field is the time reference; in the third are the geographic units to which the classification must relate; in the fourth and fifth, the characteristics by which the events are to be classified. Usually, the fourth field indicates the items to be shown in the stub of the tabulation and the fifth, the break-down in the heading. The tabulation of live births by age of mother, legitimacy, and attendant at birth — in this system of symbols — would be expressed as follows:

Field (1)	*Field (2)*	*Field (3)*	*Field (4)*	*Field (5)*
Type of data	*Time*	*Geographic coverage*	*Stub item*	*Heading items*
[B]	[1955]	[C + P_{30} + Ci_{15}]	[Am_9]	[$L_3 \times At_5$]
Live births	Year 1955	Country + Provinces + Cities	Age of mother	Legitimacy and attendant

In field (1) is the identifying symbol for the event being tabulated, in this case "B" for live births. In field (2) is the symbol for the time reference — 1955. In field (3) are the symbols for the geographic classification and the indication of how many separate classes or categories comprise the classification — in this case "C" for the country as a whole, "P" for the provinces of which there are 30, and "Ci" for cities of which there are 15. In field (4) is the symbol identifying the characteristics of age of mother, the desired classification of which has nine categories (Am_9); and in field (5) the items of legitimacy with three categories (L_3) and type of attendant with 5 (At_5).

The plus signs between "C", "P", and "Ci" show that the tabulation is to be made for each geographic group separately. The multiplication sign between "L" and "At" indicates that between these two characteristics a cross-classification is desired, though both will appear in the heading of the tabulation while age appears in the stub. The brackets themselves indicate, as in algebra, that one group may be multiplied by the other to obtain all the individual units of the tabulation, although the first two brackets [B] and [1955] can be retained or omitted, since they are for general identification only. As in algebra, the brackets can be removed by "multiplying out", with the following results:

$$[B]\ [1955]\ [CAm_9L_3At_5 + P_{30}Am_9L_3At_5 + Ci_{15}Am_9L_3At_5]$$

which indicates that at the end of the tabulating process, we should have live births by age of mother, legitimacy, and attendant for the country, for each province, and for each of the 15 cities, which is what was indicated as the goal.

There is no internationally recognized set of symbols for this algebraic system of description. Each application has resulted in a variation in the symbols chosen. The simplest approach appears to be that used above, namely, to assign to each characteristic a capital-letter symbol with or without an additional lower-case letter as, for example, L for legitimacy, Ci for cities, Am for age of mother, or At for attendant at birth. A subscript, which is a numeral equivalent to the total number of the categories in the classification (including one for the total) is placed to the right of the symbol.

The saving in space through the use of algebraic descriptions and the ability to include a large number of such descriptions on one page in such a way that they can be compared easily one with another, constitute the chief advantages of this notation system. When similar tabulations are set forth in a systematic manner, it becomes possible to judge whether or not the indicated cross-classifications actually are arranged most efficiently and whether or not a tabulation listed separately might not more easily be obtained as part of another, thus saving machine time, and so forth. On the basis of an analysis such as this, it may be seen, for example, that two tabulations which differ only in number of classes of age can be combined into one which meets the requirements of both. The subsequent presentation programme may also be planned and reviewed by the same method.

(b) *Methods of tabulating*

Manual. Manual sorting and counting may consist of tallying the occurrence of certain characteristics; it may take the form of listing certain events by their characteristics and then counting the times the characteristic appears; or it may consist of sorting reports into piles according to a characteristic and then counting the number of reports in each pile.

The tally method consists of observing a characteristic on a statistical report and of recording the observation in the form of a stroke (/) or a dot (.) in a certain category. Usually, the tallies (i.e., strokes or dots) are grouped in fives for ease in summation, this being accomplished either by diagonally crossing four parallel strokes with the fifth (𝍸) or by arranging the marks in a box, thus ⚄

[19] "The Need of an Index Statisticus" by A. W. Hedrich. *American Journal of Public Health*, Vol. 23, No. 11, November 1933. p. 1159-1164.

The obvious disadvantage of this method of sorting and counting is that it is primarily applicable only to tabulations of one or more variables without cross-classification. When cross-tabulations are attempted by this method, the labour involved and the opportunity for error are magnified severalfold. To check the compilation, the entire process must be repeated, more often than not, several times, and even so, it is often difficult to uncover the source of any discrepancy. It is a process which may not be interrupted without increasing the chance of error and one which demands close and laborious attention. It is not recommended as a method of classifying and tabulating, except when the number of items being tabulated is very small and when it is not possible to use the "individual" method set forth below.

The second method of manual tabulating consists in recording each event in a list form under headings which are the categories of the classification. This method, which is similar to tallying but does not consolidate the observations, is the one used in many countries for preparing monthly statements on registrations made. Using this method, each live birth, for example, would be listed on a tabular form by notations made in the appropriate columns of a table, i.e., sex, age-group of mother, legitimacy, and so forth. Because it maintains the identity of the observation (each event being listed on a separate row), the list method lends itself to review and verification by repeating the procedure. The counting operation is no more than a simple summation of notations by attributes, page by page. The drawbacks to the list method are its limitations in terms of tabulation detail and the amount of space required to accommodate the classifications. In order to obtain a moderately detailed classification of one characteristic, a broad expanse of working space is required. A cross-classification is even more space-consuming as well as very difficult, if not impossible, to do accurately and quickly.

The third manual method is thus the one which appears to have greatest merit. This is the system of recording on slips or on cards certain items of information with respect to an event, the sorting of these cards or slips according to a classification scheme, and the counting and recording of the number of cards which fall into each group. The obvious advantage of such a method is that the classification can be reviewed easily to determine that each group consists only of items of the defined category. Any number of cross-classifications can be made simply by further sorting any one class into sub-classes according to another variable. Finally, the counting procedure is of the most direct type and is easily repeated and easily verified. The labour involved in transcribing data to cards, and of verifying this transcription, may be time-consuming, but the flexibility of the resulting units, which can be manipulated in a variety of ways, may outweigh the initial expenditure of time. It must be emphasized, however, that if the number of units being tabulated is large and the tabulations are detailed, very careful control must be maintained or serious errors can be made in the final results.

Mechanical. The principle of individual cards is basic to the mechanical method of sorting and counting. By this method, information in the form of codes is transferred to cards by the perforation of holes in prescribed positions—holes which are then used to guide the machine in the mechanical sorting and counting of the cards. Detailed descriptions of the various types of mechanical sorting and tabulating equipment will be found in *Handbook of Statistical Organization.*[20] Suffice to say here that its advantages are those of speed and accuracy.

The problem of choosing between manual and machine methods of classification and tabulation is one which often arises. The question must be considered in terms of many factors, chief of which is the volume of work (determined by the number of events or reports handled and the number and complexity of the sorts and counts required) and the facilities in the way of available manpower and funds. In a country which has a small volume of work and readily available manpower, it is conceivable that manual methods of preparing cards or slips, and of sorting and counting by hand, might suffice. In other countries where the volume is larger but where there is still no lack of dexterous manpower, hand operations might still be economical. But, by and large, it would appear that mechanical equipment, even if only a simple installation of punching machines and verifiers to prepare the cards, and sorters to classify them, would increase the efficiency of the vital-statistics operations and release manpower for other duties, with an over-all saving in cost. The acquisition of a tabulator and other more elaborate types of machines would depend on many factors, chief of which is whether they could be economically used for the specific tabulation programme which is under way.

It may be noted here that when vital statistics are part of the larger-scale central statistical activities in a country, the method of classifying and tabulating, i.e., by hand or machine, is usually determined by the type of facilities available in the central office. A good example of this change in processing is evident in Ceylon. Vital statistics were until 1953 compiled in the Registrar-General's Office by the process of hand tallies on table forms of limited scope. On the transfer of compilation to the central statistical office, it was anticipated that the manual procedures would be replaced by punch cards and the existing machine installation would be utilized for making vital-statistics tabulations. A similar change in processing is envisioned for Thailand, where compilation of vital statistics now consists of consolidating summary tabulations of a limited type. The facilities offered by a central statistical service can be a decided advantage in processing even a small volume of vital statistics.

8. Posting

When the tabulations have been completed, the next step in the process is usually that of posting the data from the tabulation sheets to table forms. This step is necessary for several reasons. In the first place, the most efficient tabulation programme very often results in complicated cross-classifications which would not be satisfactory for publication as tables (see chapter XII). Moreover, the over-all limitations in the possible size of a publication entailed by financial considerations alone usually make it necessary to select from

[20] *Op. cit.* Chapter 7.

the tabulation programme a limited number of series for presentation. Manual posting of data, or in other words transcribing data from the original tabulation sheets to a secondary table, is usually required therefore.

In order that posting may be quick and accurate, the arrangement of data in the final table form into which the data are to be transcribed should correspond, in so far as possible, with the arrangement in the tabulation sheet from which the data are to be copied. It is obvious that if a clerk must first locate each separate figure before he can post it, there is infinitely more chance of error than if he is called upon merely to copy a column of figures which is already arranged in proper sequence. Thus, it is wise to plan the tabulations and the final tables in such a way that, with a minimum of re-arrangement, data from one can be posted on the other.

An additional aspect of the manual posting process is the necessity for control. It is important that each person who posts data be required to record on the table the nature of the work done, together with the date when it was completed and the name of the person who was responsible. This information may be recorded either on the reverse side of the table or in a space set aside for this purpose. Information of this type provides control not only over production but over the time schedule. It also provides identification of the poster, should any questions need to be clarified at a future stage, and incidentally, it tends to instil pride in performance and hence increases accuracy and neatness.

With the less complex types of mechanical equipment such as card-counting sorters, hand posting of tables is still necessary, because the machine is not equipped to print results. However, some of the newly designed electronic tabulating equipment operate in such a way that the results are recorded in a printed form of convenient size. Special equipment may also be attached to regular tabulators to transcribe the data mechanically. The advantages of the mechanical method of posting are speed, accuracy, and therefore economy. In addition to the increased production, the possibility of transcribing errors is also reduced. The elimination of the human factor at the posting stage would go far toward improving the accuracy of the results and save funds which could then be expended on analysis, the stage at which the machine is not applicable. However, machines are not infallible, and any tabulation programme requires various types of cross-checks and methods of detecting errors.

9. Error control — verification

In addition to the defects found in the original reports, mistakes made during coding, punching, classifying, tabulating, posting, and computing will be sources of error in the statistics unless they are detected and corrected. The editing of basic information reported, and the subsequent querying for doubtful or missing data, may correct for inconsistency, but unless a strict error-control programme is established as a routine part of statistical processing, proper performance standards will not be maintained, nor is it likely that the resulting statistics will have the degree of consistency and quality necessary to meet consumer analysis.

Error control in the process of producing vital statistics may take various forms. One of these is the duplication in whole, or in part, of an entire process. This method is applicable in theory to every procedure set forth above. Another method of error control is the mechanical editing of data punched on cards, which in effect is a check on the consistency of the original information and its coding and punching. Still another method is proof-reading — applicable to the posting process. The fourth method is internal checking of posted data, which usually supplements the other methods.

The detection of errors and inconsistencies by the independent duplication of a process is applicable first to coding. To verify the coding of items, it is desirable that a second person—not the person who did the original coding, but another operator — repeat the process independently. Depending on the level of error revealed, it may be possible to reduce the number of items for which verification of coding is required or to institute sample checking of reports. But the important point is the recognition of the necessity for verification of the coding process.

Mechanical punching or manual transcription also should be verified by an independent operator to ensure the maintenance of the quality of the original report and the coding. Theoretically, verification by duplication might be carried through classification and tabulation but, for these processes, other methods such as machine editing of cards and cross-checking of tabulations are more efficient.

When a set of punch cards has been prepared, error control by mechanical editing of data becomes applicable. The philosophy behind this method is contained in a paper prepared for the International Seminar on Statistical Organization,[21] in which it is noted that:

> "Although we must recognize that we probably do not significantly improve the quality of the survey by the 'correction' of data errors, it is essential to complete, by supplying codes for missing items and make the punch card internally consistent before proceeding with tabulation. The wisdom of this procedure arises from the economy obtained in tabulating a clean, complete deck of punch cards and from the requirement of publishing tables which the reader cannot discredit by the discovery of obvious inconsistency."

Preliminary mechanical editing for inconsistencies eliminates many potential "errors". A set of pre-determined criteria are established, and the machine acts to reject any card which fails to meet the criteria. These cards can then be corrected before they lose their identity in the tabulation. The contribution to efficiency which this mechanical method of editing provides has been expressed as follows:[22]

[21] *Management of Error in Data Processing*, prepared by Lawrence A. Wilson, International Business Machines Corporation. (International Seminar on Statistical Organization, sponsored by the Government of Canada and the United Nations, 13-31 October 1952, Ottawa, Canada. Paper Number 8.4.)

[22] "Punch Card Methods for Census Tabulation" by Lawrence A. Wilson. Reprinted from *Estadística*, Journal of the Inter American Statistical Institute, Vol. VII, No. 25, December 1949. p. 556.

"The application of the ESM [Electronic Statistical Machine] to the mechanical editing of data contained in punched cards is an important contribution to efficiency in statistical processing. The detection of errors by manual methods is often uncertain and always costly. Preliminary editing of enumerated data by subject matter specialists, and complete verification of coding and punching by manual repetition of the original operation, generally add very little, per dollar of their cost, to the over-all quality of statistical results. Frequently, these operations reveal more errors which need not be corrected than they do errors of significance, and embarrassing inconsistencies in final tabulations are often the residue of human error which the manual verification process has failed to eliminate. The development of adequate mechanical editing procedures to supplement sample verification of original operations can produce better results at less cost."

Verification of data in posted tables can be accomplished in two ways: (1) by the duplication of the posting process and the subsequent comparison of the resulting table with the first one, and (2) by the proof-reading approach whereby one person reads from the original while another scans the posted data. Either of these methods is satisfactory, especially when supplemented by "internal checking" described below, but obviously the first method of duplicate processing is superior, though time-consuming, and thus to some extent uneconomical.

A second method of uncovering errors in posted tables depends on the initial design of the table. Tables can be designed to provide "internal checks" in the form of marginal totals which may be verified by summing the parts, or by planning for inter-table correspondence of certain elements. The planning of the tabulation programme should always include provision for such "check totals" so that successive tabulations can be compared, and it can be seen that no cards have been lost or mistabulated. Such verification can fail, for example, when compensating errors in the transposition of figures are made, but it is anticipated that either proof-reading or duplication of posting would reveal errors of this type. The important consideration is that in any well-controlled procedure, data verification must not be omitted.

A third and supplementary step in controlling errors in tabular data needs to be mentioned here. It is the technical review of tabulations, designed to assure the credibility, consistency, and plausibility of the data. This process, which is actually one of evaluation, should not be overlooked in organizing the vital-statistics system.

10. Computing

Vital-statistics rates and ratios are constructed from vital-statistics frequencies by relating them in various ways to each other or to corresponding populations. The process involved is known as computation. Almost always, this process is conducted with the help of electrical or manual computing equipment, but it need not be. Longhand arithmetic will suffice for most computations, although it is time-consuming and subject to error. The description of and formulae for various indices will be given in chapter XIII; suffice to emphasize here that this process too requires rigid verification by an independent operator. Misplacement of decimal points, inconsistent rounding procedures, as well as errors in the actual computation, must all be eliminated before the indices are used or published. The only method of ensuring an adequate level of accuracy is to repeat the process independently and compare the two results. Review of the rates and ratios for consistency and credibility, both historical and internal, should also be a distinct step in the process in order that a high level of statistical quality may be maintained.

11. Presentation

"Presentation" has been defined in the *Principles for a Vital Statistics System*[23] as the "making available of statistics, through publication or other means of dissemination". This is the process which is the culmination of the long series of operations described above. Poor planning will result in material inadequate for presentation. Low standards of coding, punching, classifying, tabulating, and posting will also be revealed when data are prepared for presentation. Presentation can never overcome the inherent deficiencies either of the data themselves or of their handling. Conversely, poor presentation can destroy the effects of all the good work which went before.

Because of the fundamental importance of good presentation, the publication programme of a vital-statistics office should receive careful consideration. Assuming the adequacy of the statistics, clearly printed reports of pleasing format should be the desired goal. Whether this goal is achieved by type-set printing, by off-set printing, by mimeographing (cyclostyling), by hectographing, or by some other means of reproduction is not important. If the release is well planned and the work carefully done, the publication which results will usually meet the requirements of good presentation.

Good presentation also requires attention to content. It is not sufficient to present statistical tables alone. Each collection of data should be accompanied by a clear, explanatory text and, if possible, by an analysis. Without annotations which explain their limitations and qualifications, the data lose much of their usefulness as source material. An analysis of the meaning of the data is very desirable but not so fundamental as the technical explanatory notes.

It is also desirable that the publications of a vital-statistics office should conform to a plan — be part of a series designed to meet specific needs. Each series should be identifiable to facilitate filing and reference in libraries. It is advisable, however, to make sure that the emphasis on a plan of publications and the maintenance of series should not delay publication. Regular and prompt publication of results is necessary if the vital-statistics office is to fill the "service" function for which it was established. Conversely, it is important that flexibility be maintained in the publication programmes to allow for presentation of tabulations of special interest.

Reliable information published in a pleasing and readily used form is of little use unless it is made available to the proper consumers. It is the duty of the

[23] *Op. cit.*

vital-statistics office to find out who its consumers are and to maintain a system of mailing lists and correspondence which will ensure that the publications or releases are placed promptly in the hands of interested readers. Published statistics represent the product of the vital-statistics system and, unless the product is made known to the public, their willingness to support the system cannot be expected. The provision of means for dissemination of vital statistics should be a fundamental concern of the vital-statistics system.

CHAPTER XII

TABULATION — PRINCIPLES AND PROGRAMME

Of the various activities of a vital-statistics office, perhaps the most important is "tabulation". Certain principles underlie the tabulation programme, whether it be simple or complex, implemented by hand or by machine. These will be discussed in detail below.

According to Principle 401 of the United Nations *Principles for a Vital Statistics System,*[1] the goal of the tabulation programme is:

> "(1) the provision of total monthly or quarterly summary counts of live births and deaths (and of foetal deaths, marriages and divorces if these are included in the collection programme) on a time schedule prompt enough to provide information for administrative or other needs; and (2) the production of detailed annual tabulations of such type and on such time schedule as will make possible their effective use for the scientific analysis of the interrelationship between demographic, economic and social factors, for planning, operating, and evaluating public health programmes, and for other purposes as required. In so far as possible, such statistics should be comparable on an international basis and lend themselves to international analysis."

It will be seen that this Principle places emphasis on meeting needs — both administrative and scientific. It re-affirms the basic concept that the reason for the existence of a vital-statistics system is to make available useful statistics and to do this promptly. Thus, the Principle takes note that monthly or quarterly total counts of a summary nature are required especially for administrative purposes such as those concerned with post-natal care, home nursing, immunization programmes, production of consumer goods, and the like, while detailed annual tabulations must show interrelationships of demographic with other related factors in such a way as to meet the further requirements of public-health programmes or those of related activities such as public housing, education, population policy, and so forth.

All of these are national needs — the needs which justify the organization of a national vital-statistics system. However, the Principle takes note of another need which should, if possible, be met and that is the international. The Principle subordinates this aspect of the goal by saying that "in so far as possible, such statistics should be comparable on an international basis and lend themselves to international analysis". Certainly, international comparability is desirable, but it is not the main goal of the tabulation programme nor of the system itself. However, in view of the fact that demographic problems throughout the world are similar, it is desirable that an interchange of experience be made possible. Such interchange is feasible only if statistics are comparable in definition, coverage, classification, and tabulation. Therefore, the tabulation programme should seek to meet international requirements but not at the expense of national needs. In so far as possible, the programme should conform to the international recommendations for the improvement and standardization of vital statistics.

The efficiency with which the tabulation programme achieves its goals is measured by a number of criteria, one of which is the coverage and representativeness of the statistics. Another is their quality in terms of the accuracy and completeness of the basic data in relation to certain standards, and their comparability; still another facet is that of scope — whether the tabulations are detailed enough or sufficiently far-reaching to reveal important relationships; a fourth is the timeliness or currency of the data. To achieve these goals, the tabulation programme should be constructed on basic principles which are discussed below.

A. Coverage

1. TABULATION AREAS

One of the basic premises of the vital-statistics system is that every vital event which occurs among the population of the geographic area should be first *registered* for legal purposes (Principle 203) and secondly, *reported* for statistical purposes (Principle 301). Ideally, therefore, the goal of tabulation coverage should be 100 per cent in respect of both geographic areas and population groups. Even in the most advanced societies, however, it is known that a small percentage of births and deaths may fail either to be registered or reported on time. Thus, for all practical purposes, the standard of tabulation coverage falls to a more realistic level, somewhat short of 100 per cent.

(a) *International recommendation*

The United Nations recommendations on the matter of tabulation coverage have been set forth in Principles 402 and 403,[2] both of which state the fundamental concept of complete geographic and ethnic coverage in tabulations. But these Principles, as will be seen below, also recognize the inevitability of less than perfect compliance, and the need for standards against which performance may be measured objectively.

> "402. *Tabulation area — geographic aspect*
>
> "(*a*) In accordance with individual national conditions and needs, specific standards for completeness of registration and data coverage should be set up, and every effort should be made to ensure that the data for the entire national territory meet these standards.

[1] *Principles for a Vital Statistics System; Recommendations for the Improvement and Standardization of Vital Statistics.* United Nations. Statistical Office. Document ST/STAT/SER.M/19, 26 August 1953. p. 17. (Sales No. 1953.XVII.8)

[2] *Ibid.* p. 17.

"(*b*) Where it is impossible to secure figures for the entire national territory which meet the pre-determined degree of completeness with respect to registration and data coverage, detailed tabulations should be made only for data from geographic areas which meet the specified conditions. Separate but regular tabulations should be made for data from areas falling below the determined criteria, and efforts should be made to improve registration in the sub-standard areas with a view to including them as soon as possible in the 'national tabulation area'.

"(*c*) In such cases where the national tabulation area is less than the national territory, special care should be taken to explain limitations of coverage and the implications thereof wherever the statistics appear."

"403. *Tabulation coverage — ethnic aspect*

"(*a*) Every effort should be made to ensure that national vital statistics refer to the total population of the country.

"(*b*) Where registration of vital events among important population groups is very incomplete and/or the quantity or quality of original data is very deficient, separate tabulations may have to be made for the various segments of the population and an explanation of the limitations in coverage given wherever the statistics appear.

"(*c*) In countries where the social and economic Characteristics of large segments of the population vary greatly, it is recommended that, in so far as possible, the identity of each important population group be maintained in the tabulations . . ."

The exact value of the standard of acceptable coverage will be determined by many factors, among which are the conditions and needs of the country in question. Many countries may feel that underregistration and underreporting are so rare that no test need be applied. For these, the tabulation area is automatically the entire country. Other areas may realize not only the possibility of over-all deficiency but also that there might be wide geographic variability in the degrees of underregistration and underreporting.

Because of these geographic differences, it will be inevitable that some countries will not be able to place their standard of tabulation coverage at a level which will include data for the entire country. These will usually be countries which are in the process of developing a vital-statistics system — a process which cannot, for reasons of finance and lack of trained personnel, be carried on at the same time and with the same degree of intensity in every part of the country and among all segments of the population. It is inevitable that some areas, having better facilities for communication, a higher standard of living, or better organization for vital statistics, will advance faster than others. In such cases, it is recommended as an interim measure that some of the more detailed tabulations be limited to data coming from the areas or population groups where coverage is more complete and of known quality — the so-called "tabulation area" — while separate but regular tabulations are made from reports supplied by the sub-standard areas.

(b) *National practice*

Geographic areas. The technique of dividing the tabulations into two parts, including in one the reports which are thought to meet certain pre-determined standards of coverage and quality and in the other, those which fail to meet the standard, has been found of use by several countries in developing their vital-statistics systems. Chief among the countries which have adopted the geographic-type application of this technique is the United States of America.

For many years, demographers and public-health workers in the United States were faced with the fact that vital statistics did not exist for the country as a whole. As late as 1916, Cressy L. Wilbur, who was Chief Statistician for Vital Statistics of the United States Bureau of the Census 1906-1914, stated in a paper[3] prepared for the Second Pan American Scientific Congress held in Washington that:

> "It is with some feeling of mortification that we are obliged to confess in the presence of this Second Pan American Scientific Congress that the United States does not now possess the means of recording the births and deaths of all its inhabitants, a matter deemed most important among all civilized nations. It is with even greater regret that it must be admitted that, according to the present rate of progress, unless motives unforeseen should induce the American people to demand more speedy action, it will be many years before this object is accomplished."

The basic problem in the development of vital statistics in the United States was the fact that vital registration and statistics were functions of state government. The Federal Government had, and even today has, no specific jurisdiction, except the responsibility to develop a co-ordinated system. Therefore, the development of national vital statistics in the United States of America had to be a "piecemeal" affair.

Beginning with the Tenth Census (1880), an experimental "registration area for deaths" was established for the United States, but in it could be included only two states and 20 cities, the aggregate population of which amounted to 17 per cent of the United States total. The reason for its exclusive nature was that these two states, Massachusetts and New Jersey, and the 20 cities were the only areas which could prove 90 per cent complete registration, the criterion adopted for including any area in the tabulation area. By 1900, the annual collection of mortality statistics had been extended to ten states plus the District of Columbia. This group was known as the "death registration States of 1900", and it included Massachusetts, New Jersey, Connecticut, New Hampshire, New York, Rhode Island, Vermont, Maine, Michigan, Indiana, and the District of Columbia.

The first point to be emphasized with respect to the United States "registration area for deaths" is that the criterion which governed admission to the group was the degree of completeness with which registration of deaths was carried out in each state. The test which was applied will be discussed in chapter XIV,

[3] *The Federal Registration Service of the United States: Its Development, Problems, and Defects* by Cressy L. Wilbur. Department of Commerce. Bureau of the Census. Gov. Print. Off., Washington, 1916. p. 37.

but suffice to say each state, in order to be admitted to the "registration area", was supposed to prove that at least 90 per cent of the deaths occurring in the state were being registered and reported to the national vital-statistics office. It should be noted here that at the beginning of the development of the "registration area", any state falling below the standard was dropped, that is, reports were no longer accepted for national tabulation until it could be proved that completeness of registration had been improved to 90 per cent. This technique of exclusion after initial acceptance was later discontinued and, by 1933, all the states of the Union had gained admission to the tabulation area for mortality statistics.

For birth statistics, the history is a little different. Emphasis on the needs of public health had produced a system aimed primarily at developing mortality statistics. In 1908, an attempt was made to obtain transcripts of all births registered in the United States under state or city ordinances, but the results showed that at that time probably less than one half of the births that occurred in the United States were recorded.[4] This "provisional birth-registration area" was used in 1909 and 1910 to collect statistics of natality from areas where registration seemed most efficient but, in fact, it was not until 1915 that the national "birth-registration area" was set up and more or less reliable statistics obtained. In 1915, ten states and the District of Columbia were eligible to send birth reports to the national office; by 1933, all 48 states were included. In that latter year, it became possible for the first time to have nation-wide statistics of live births and deaths in the United States. The quality in respect of coverage had varied widely among states but, theoretically, in 1933 the entire country was covered by an integrated vital-statistics system. The growth and development of the system was based on the technique of selecting as a nuclear tabulation area, states and cities where birth registration was of known adequacy, and of augmenting this nucleus by the addition of other areas as they reached the standard until the whole country was included.

One deficiency of the technique as applied in the United States of America is that tabulations were limited to those for the "registration areas" and, therefore, even approximations for the entire country were lacking until 1933. To meet this limitation, a modification of the method, by which tabulations are divided into two groups — one for the areas meeting the criteria and the other for those failing to meet them — provides a means of analysing the deficiencies and of promoting improvement. Such a modification has been applied with good results in India, Egypt, Mexico, Ceylon, and Yugoslavia, for example.

In India, certain areas of the country (the parts known as the British Provinces before 1947) were able to carry out more complete registration and collect better information than the rest of the country. Because of this, these provinces became the "registration area" for which certain broad tabulations were made, while for the whole country a total count alone was provided. Current vital statistics for India also refer to a "registration area" which changes in geographical coverage annually.

[4] *Ibid.* p. 44.

Several other related examples may be cited. In Egypt, live births and deaths are registered by medical officers in the "health-bureau localities" and by tax collectors in other parts of the country. About one third of the total population lives in health-bureau localities, and the statistical report form used in these areas differs from that used elsewhere. Cause of death, for example, is required on the health-bureau-area reports but not on the general statistical report completed by the tax collectors. Hence, the tabulation programme is different for these two groups.

The "proclaimed areas" of Ceylon are those urban areas which have health units of a certain type and, hence, "medical" registrars. This is similar to the Egyptian situation. A notable difference exists in Ceylon, however, in that the statistical report form used is identical throughout the country. Statistics relating to the "proclaimed areas" are presumed to be more accurate and, for this reason, stillbirth statistics are tabulated for those areas alone, and cause of death in these areas is tabulated in more detail than it is for all of Ceylon.

A somewhat analagous situation existed in Mexico in 1950. Two types of statistical reports were employed there — one for events occurring in cities of 25,000 and over, the other for places of lesser size. The distinction was made on the basis of the quality of the expected response to certain questions in the urban areas as contrasted with that to be obtained in the more rural parts of the country. In accordance with this concept, certain tabulations, such as births by age of mother and of father, were limited to data from urbanized areas where the quality of the information was better.

In certain other countries, such as Burma and Brazil, vital-statistics tabulations are limited to data for cities where facilities are relatively well organized. Yugoslavia, while tabulating some vital statistics for the whole country, limits its cause-of-death distributions to deaths in an area which includes about 22 per cent of the population.

Population group. Perhaps the most outstanding example of the application of the technique of establishing "tabulation areas" on the basis of population groups rather than on geographic areas, is found in the experience of New Zealand where the collection programmes for Maori and European populations have been separate since their inception. Until recent years, underregistration has been much greater among the Maori population than among the European. For this reason, it has until recently appeared expedient to run two series of tabulations. However, as socio-economic factors exert a levelling influence, the gap between the quality of the two series is being closed, with the result that distinction is no longer made in marriage statistics, and joint, as well as separate series, are available for certain other vital statistics.

A similar separation in the tabulation programme of vital statistics in the Union of South Africa is based on the fact that in 1950 registration was not universally compulsory in that country, with the result that, among the "natives" (Bantu) it is very incomplete. Separate tabulations are made by race or colour, i.e., White, Asiatic, Coloured, and Native, and these in turn are consolidated into "European" (white) and "non-European". In general, statistics for Africa maintain this dichotomy of indigenous and non-indigenous

tabulations, based on relative completeness of population-group coverage.

Further examples of differential tabulation programmes may be found in Israel, where data for the Jewish population are distinguished from the total (as they were in statistics for Palestine); those for Algeria which differentiate vital statistics relating to the Moslem population from those for the European. Although not precisely analogous, it may be mentioned that data relating to Indian jungle population in Peru, Venezuela, and Panama are usually excluded from the general tabulations because of incompleteness, while aborigines in British Guiana and Formosa and nomadic population in other countries are systematically excluded for similar reasons. In reality, these latter examples are not differentiations of tabulations for variation among population groups but rather a recognition of the fact that the registration law — while covering these inhabitants in theory — does not in actuality produce satisfactory results among these population segments.

(c) *Biases in unsystematic selection of areas*

The practice of limiting detailed tabulations to areas of known completeness of coverage may be very helpful in establishing and maintaining standards of quality, so long as it is an interim arrangement. It must be viewed as a means to an end — that end being complete coverage. Emphasis on the interim nature of this method is made here, because vital statistics derived from selected areas or groups of population are not necessarily representative of the whole, and representativeness is one of the basic elements in achieving the goal of the tabulation programme.

Biases resulting from the selection process itself are inherent in the population-group type of tabulation area, as well as in data limited to geographic "tabulation areas". In order to select the area of the country for which tabulations will be made, some criteria must be applied.

In the development of the United States national registration area, the criterion was the ability of a state to prove 90 per cent or more completeness of registration. That meant that states with the best registration facilities were included. Obviously, those states were also the states which had been established first and were, therefore, those with the longest experience in civil administration. These were the states where housing, public health, and medical-care facilities might be assumed to be more adequate, but they were also those whose population was older. Therefore, the vital statistics derived from a tabulation of births and deaths registered in these states showed lower infant mortality, lower general birth rates, and higher death rates than might have been expected from the rest of the country. With the inclusion in the registration area of states with younger populations, the vital-statistics rates changed, not solely because of changes in mortality or natality, but because of changes in the composition of the population included in the area.

A similar, perhaps more pronounced, bias is introduced when vital statistics are limited to urban areas or to those having, for example, "established health centres". Because they are provided with medical-care facilities not common throughout the territory, such areas cannot be representative of the entire country.

The lack of "representativeness" of data derived from such nuclear areas should not be construed as a criticism of the technique as a means of developing vital statistics. Certainly, where resources are limited, efforts to develop a system which will produce vital statistics adequate to meet needs must be restricted to areas or populations where they will be most effective. Many factors will affect the choice of these areas. In federated countries, the most direct method is province by province or state by state. In countries with a comprehensive national programme of health-centre establishments, the areas served by these centres will almost surely serve as the nucleus of the system. Countries with wide variations in the economic and social development of identifiable population groups will almost surely begin with the more advanced segment.

(d) *Systematic area selection by sampling*

If circumstances permit, however, it would be advisable to consider the selection of the units of a "tabulation area" by systematic representative sampling. If it were possible to choose from the regular administrative subdivisions of a country a certain number of areas which (in so far as vital statistics were concerned) would be representative of the country, and if these areas were not in excess of the total area over which available resources might be spread, it would be possible to concentrate efforts to improve registration and reporting in these chosen areas with a view to deriving from them vital statistics representative of the whole.

It is emphasized again that such an arrangement should be purely temporary and supplementary. The ultimate goal must be universal registration not only for its legal value, but because with the sampling approach, the areas chosen as the nucleus would not remain unchanged. Changes taking place within those areas, such as large-scale migration movements or those resulting from developing economic or social factors, might make them unrepresentative at any future time. It would not be possible, therefore, to select a nucleus area which could be relied upon indefinitely to produce reliable sample national vital statistics. The objective would have to be the constant augmenting of the area by the addition of other areas and a continuous evaluation of its representativeness until the established standard of completeness were attained.

The advantages of the sampling method would be that in the interim period, the vital statistics derived from such a sample tabulation area could be used, within limits, as representative of the country. They would not suffer from the biases which may result when the selection of areas is based on facilities available, or on ability to meet certain criteria. And, most important, this method would provide a system for allocating national aid and assistance for developing a vital-statistics system, thus decreasing the danger that such resources as are available might tend to lose their effectiveness by being diffused over too wide a territory.

B. Time reference

Like every other type of event, a vital event is defined in terms of "time" and "space". A geographic specification should place the event in "space", that is, within the boundaries of some administrative unit; a

time reference should place the vital event within a defined calendar period.

1. Date of occurrence and date of registration

In relating vital statistics to a time period, two possible reference points may be considered — first, the date when the event occurred and second, the date when the event was registered. The date of registration will naturally be later than the date of occurrence, the extent of "lateness" and the variability depending on a number of factors which will be discussed below.

Both date of registration and date of occurrence are the bases of national tabulations. Each has a meaning, but the date of occurrence alone is the objective date, unaffected by extraneous factors such as climate, season, transport facilities, etc., and, therefore, it is assumed to offer the best basis for comparability.

(a) *International recommendation*

In recognition of the advantages of date of occurrence as a basis for tabulations, it is suggested as the desired time reference in Principle 408:[5]

"408. *Tabulation by date of occurrence or date of registration*

"(*a*) Final tabulations for any calendar period should be based on events which occurred during that period and not on those registered. Should it be administratively necessary to tabulate final figures by 'date of registration' rather than 'date of occurrence', evaluation studies should be made to determine the degree to which tabulations by date of registration approximate those by date of occurrence, and it is desirable that the analyses of this relationship be published.

"(*b*) For purposes of current weekly, monthly, or quarterly summaries which must be compiled rapidly, counts referring to date of registration may be used but in this case also it should be demonstrated that analyses based on events which are registered during a period can be interpreted in terms of those which occurred."

According to this Principle, final annual tabulations by date of registration are appropriate only for those countries where it is established that data on that basis may be used interchangeably for all practical purposes with those by date of occurrence. This means, in effect, that unless registration is complete, date-of-registration statistics are not a desirable substitute for those by date of occurrence. It means also that date-of-occurrence statistics will need to be accompanied by a measure of the degree of underregistration. The reason for this rigid standard is that substitution of date-of-registration tabulations for those by date of occurrence will introduce distortions into the statistics unless date of registration does not differ appreciably from date of occurrence.

The distortion introduced by date-of-registration tabulation is probably most important in connexion with live-birth statistics. A rather lengthy period is usually allowed for regular birth registration. Because of this and because registration of live births often tends to be delayed even beyond this limit, many factors other than those influencing fertility can cause a fluctuation in a birth rate computed on the basis of events registered. For example, a demand for proof of birth to meet some administrative requirement may cause a number of delayed registrations to be made and hence increase the recorded birth rate, calculated on the basis of registrations.

The possibility of misinterpretation of birth statistics tabulated by date of registration is increased in relation to monthly data. Seasonal variations in fertility may be completely obscured by the variation introduced by the seasonal pattern of registration. Inclement weather or an epidemic may delay registration to such an extent that a subsequent otherwise normal month will record an abnormally high birth rate.

Death statistics, except for the neo-natal, infant, and maternal mortality rates in which the denominator (live births) is affected, are not so subject to distortion by date-of-registration tabulation as are birth statistics. This is so because the time allowed for registration of a death is usually very short, under five days for most countries and 24 hours for many. Moreover, the obtaining of the necessary burial permit, which is contingent on registration, serves as a control on death registration in most urban and rural areas. Nevertheless, the time lag may be enough to distort monthly death statistics.

Neo-natal, infant, and maternal mortality rates are, however, subject to distortion because they are computed in relation to live births. Severe fluctuations in the number of births registered will thus affect these rates unduly. Moreover, in the conventional rates — rates by date of occurrence — the neo-natal, infant, or maternal deaths of the calendar period are related to the live births of that same period, irrespective of the fact that strict correspondence between the numerator and the denominator has not been obtained by this procedure. Methods to obtain greater correspondence involve relating the deaths to the cohort of births from which they have come — a relationship which depends on the date of occurrence of the birth and the death.

Stillbirth statistics themselves are not subject to distortion by date-of-registration tabulation because of the fact that such stillbirths as are registered are declared promptly, either because they occurred while the mother was receiving medical care or because of the need for a burial permit. However, stillbirth ratios, which are computed on a denominator of registered live births, may be subjected to wide fluctuations.

In the case of marriage statistics, the delay-in-registration factor is important only in countries in which registration of marriages is a procedure distinct from the celebration of the event. In such countries, the civil registration may be delayed for a long period following the ceremony and, hence, tabulation of statistics by date of registration would entail some distortion. Marriage statistics for Algeria provide an example. In that country, provision of a social security programme after the Second World War resulted in a sudden and very large increase in marriages registered by the civil authorities, as individuals desirous of participating became in need of proof of marriage. Since many marriages had been performed only according to Moslem ritual, the obtaining of acceptable "proof" required delayed civil registration. Date-of-registration statistics in such cases are meaningless as measures of current nuptiality.

[5] *Principles for a Vital Statistics System, op. cit.* p. 18.

Divorce statistics are perhaps the least subject to distortion by date-of-registration tabulation because, in many countries, the statistics are based on court records in which registration and granting of the divorce are simultaneous, and because, in the others where statistics are based on civil registration of the divorce, the immediate legal importance of registration is sufficient to ensure fairly prompt registration. Again in the case of Moslem populations, where divorce as well as marriage can be a private ritual not requiring a civil action, there may be a tendency to delay or omit registration with the civil authorities but, in general, for personal reasons, prompt registration is the rule.

In support of date-of-registration tabulations, it is sometimes claimed that, in most countries, the total number of registered events will approximate closely the number which actually occurred, because the omission of registrations of a current year will be compensated for by the inclusion of a corresponding number from previous years. If registration is current — that is, if there is no serious underregistration problem and a short time period is allowed for compliance — then it might be assumed that the registrations in the first month of the year of events which occurred in the latter part of the previous year would perhaps compensate for failure to register in the current year events which would occur in the closing weeks. This also assumes a fairly stable rate of occurrences and no sudden change in registration pattern. However, even in countries where registration is now complete, recording of a sizable number of delayed registrations from past years would invalidate these assumptions.

In countries where there is a problem of underregistration, the gross volume of events from past years included would rarely approximate those omitted. An example from the statistics of the Dominican Republic will suffice to show the degree of compensation which might be expected in connexion with live-birth statistics. The number of live births by year of birth and by year of registration, 1936 to 1946, is set forth in Table E.

Table E. Number of live births by year of birth and year of registration: Dominican Republic, 1936-1946

Year of Birth	Year of Registration											Total Occurred
	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	
1946	—	—	—	—	—	—	—	—	—	—	67,937	67,937
1945	—	—	—	—	—	—	—	—	—	53,589	5,796	59,385
1944	—	—	—	—	—	—	—	—	48,145	4,295	351	52,791
1943	—	—	—	—	—	—	—	52,458	10,086	109	253	62,906
1942	—	—	—	—	—	—	52,148	17,183	1,793	69	174	71,367
1941	—	—	—	—	—	28,860	11,642	8,224	1,323	35	151	50,235
1940	—	—	—	—	34,769	12,067	2,284	6,610	1,164	41	132	57,067
1939	—	—	—	21,462	30,856	2,782	1,248	5,107	1,047	30	99	62,631
1938	—	—	18,829	15,967	13,616	1,713	862	4,373	856	30	118	56,364
1937	—	19,973	12,010	4,710	9,771	1,289	605	3,977	861	23	103	53,322
1936	18,954	16,033	3,134	2,434	6,633	956	509	3,758	822	22	89	53,344
Previous years	32,295	17,738	8,107	8,194	21,223	5,675	3,335	24,427	6,686	531	1,481	129,692
Total Registered	51,249	53,744	42,080	52,767	116,868	53,342	72,633	126,117	72,783	58,774	76,684	

The data in Table E show first that there was, at least during 1936-1946, a definite problem of underregistration. The erratic fluctuations of "registrations" from year to year will be clearly seen. Registrations in 1940 are more than double those recorded in the previous or following years. Nineteen forty-three also shows a sharp increase. Both of these one-year increases had their origin in administrative changes related to birth-registration procedures.

The lack of correspondence between the number of registrations recorded in any one year and the number of births which actually occurred can also be demonstrated from the data for the Dominican Republic. Data for 1936 and 1937 appear to substantiate the theory of compensation but, beginning with 1938, there is contrary evidence. In 1938, 42,080 births were registered, including 18,829 which actually occurred in that year. By 1946, an additional 37,535 births of the year 1938 had been registered, making a provisional total of 56,364 occurrences for that year. This figure is well in excess of the 42,080 registrations recorded in 1938, and it is obvious that a rate based on registrations would have understated the true birth rate by at least 25 per cent. The same relationship holds true in 1939. In 1940, the reverse occurs. Because the 116,868 births registered in 1940 included almost 20 per cent which occurred prior to 1936, they overstate the possible occurrences by a wide margin. It is conceded that a number of births which occurred in 1940 may still remain to be registered, but these unregistered births could hardly number 59,000. Registrations for 1943 also overstate the potential number of births which could have occurred in that year. It would appear from these data that underregistration cannot be compensated for by date-of-registration tabulation. Quantitative approximation is not achieved.

It should be emphasized that even if gross compensation could be achieved, there would still be no

real compensation because the characteristics of the births may change from year to year. Facts derived from an analysis of births registered in a current year may, in reality, be describing partly the fertility picture of a year or more ago. For the Dominican Republic in 1943, they would be describing a situation based on births more than half of which occurred prior to 1943 and one fifth of which referred to the fertility experience of more than eight years previous. Neither quantitative nor qualitative identity is possible under such circumstances.

The date-of-registration method has often been used for final as well as provisional tabulations because of the ease of summary counting which gives the apparent advantage of making vital statistics available quickly after the expiration of the time period in question. This apparent advantage of promptness is, however, offset by the strong disadvantage of the risk of noncomparability introduced by date-of-registration tabulation. Unless the period of time allowed for registration of vital events were uniform throughout the world and unless all events were registered with a minimum of delay within this uniform period, tabulations by date of registration would have little comparability from one area to another.

Another important disadvantage often overlooked has to do with the use of date-of-registration birth statistics in the computation of annual population estimates by the natural increase method. In estimating population by this method, one starts with a census enumeration of population, assumed to be accurate, to which are added births and immigrants and from which are subtracted deaths and emigrants. If the registered births in any year include some which occurred prior to the census date, it is obvious that these individuals will be included twice — once in the enumeration and again in the registered births by which the census count is increased. The result will be an upward bias in the estimates. Such a bias can cast undeserved doubt on the accuracy of the results of the succeeding census when it is found that the intercensal estimates are not in agreement with them.

In conclusion, it may be said that despite the acknowledged incompleteness in date-of-occurrence statistics, they are at least clearly defined and unambiguous. They represent a simple concept, that is, events which occurred during a specified period of time. There are ways of describing the accuracy of data tabulated according to this concept. Date-of-registration tabulations, on the other hand, represent an obscure concept in terms of time, and they are in addition subject to all the possibilities of distortion introduced by many diverse and uncontrollable factors.

(b) *National practice*

According to information in the Statistical Office as of 1 September 1954, the countries which tabulate vital statistics according to the time reference recommended by the United Nations, that is, by date of occurrence, were the following:

Albania
Austria
Belgium
Bolivia
Bulgaria
Burma
Canada
Czechoslovakia
Denmark
Dominican Republic
England and Wales
Finland
France
Hungary
Iceland
India
Indonesia
Iran
Italy
Jamaica
Japan
Jordan
Liechtenstein
Luxembourg
Maldive Is.
Monaco
Netherlands
Norway
Pakistan
Panama
Philippines
Poland
Portugal
Romania
Saar
San Marino
South Korea
Spain
Sweden
Switzerland
Union of South Africa
United States
Western Germany and Berlin
Yugoslavia

Those whose tabulations were on a date-of-registration basis were the following:

Argentina
Australia
Ceylon
Chile
Colombia
Costa Rica
Cuba
Ecuador
Egypt
El Salvador
Guatemala
Greece
Honduras
Ireland (Rep.)
Israel
Lebanon
Mexico
New Zealand
Nicaragua
Northern Ireland
Paraguay
Peru
Scotland
Syria
Thailand
Uruguay
Venezuela

2. CUT-OFF DATE

The selection of the date of occurrence as the basis for tabulation requires determination of a terminal date before which the final tabulations cannot be made. Since varying periods of time are allowed (in some countries, up to 90 days for live births) during which an event may be registered and since the count is to consist of the events which occurred during a calendar period, it is clear that complete registration and statistical reporting of those events which occurred near the end of the calendar period cannot be expected until some time during the year following the year of occurrence.

How much time will need to be allowed for statistical reporting of events which occurred during any calendar year in order to be sure that all occurrences are reported?

(a) *International recommendation*

The United Nations has not recommended any specific time period for reporting, but rather has stated the principle of "cut-off dates" in Principle 406.[6]

"406. *Tabulation coverage—'cut-off date'*

"(*a*) Final annual tabulations should be made on the basis of statistical reports received before a specified date known as a 'cut-off date', determined by each country on the basis of national factors such as the period allowed for registration and the channels for statistical reporting.

"(*b*) Reports received after the cut-off date, which will include reports on events which have

[6] *Ibid.* p. 18.

been registered by any means at varying times after the expiration of the legal maximum declaration period, should be tabulated separately by date of occurrence in order that they may provide a means by which analysis of the problem of delayed registration, declared registration, and delayed reporting may be made with a view to initiating appropriate remedial measures, if required. Unless the volume is very large, extensive detailed national tabulations would not ordinarily be made on these reports."

The factors to be considered in determining the national cut-off date include the legal length of time allowed for registration, with allowance for the "practical" time actually observed. Obviously if a period of 90 days is permitted for registration in a remote area, then a period of at least 120 days would need to be allowed for completion of statistical reporting. The decision should be based on a consideration of all the factors involved — not only the permissible registration period, but the number of offices through which the report must travel before reaching the statistical authorities. The efficiency of communications must also be considered as well as the reliability of personnel in the registration service.

In so far as the statistical tabulations are concerned, this arbitrary cut-off date fixes the number of occurrences which will be counted for any period. However, reports received after that date should not be disregarded. If it can be done without delay to the programme, they should be included in the regular tabulations; otherwise they should be treated as a separate group. Unless they are numerous, detailed tabulations would not ordinarily be made, but an analysis by date of occurrence, date of registration, and date of reporting might be made to throw light on the problems of delays and underregistration and the manner in which they might be overcome.

C. Geographic reference

The identification of statistics with a geographic area is fundamental to tabulation. This involves locating each observation within the boundaries of a specific geographic area and, for vital statistics, it also involves relating the event to the population group which produced it.

1. Place of residence and place of occurrence

In relation to vital statistics, every country, province, county, city, or district within a city has two pertinent factors. First, it has its physical boundaries which are political, administrative, and geographic. In addition, it has the people who are in the area. At any moment, those people may be considered as divided into those who maintain their usual place of abode within the physical boundaries of the area and those who have their usual residence elsewhere but happen to be in the area at the moment. Vital events which occur in each area can relate to members of either of these groups, the residents or the non-residents, and it is this distinction which is important in the tabulation of vital statistics.

(a) *International recommendation*

Because the basis for geographic tabulation may be either "place of occurrence" or "place of residence", and because resources are usually limited, it is necessary to choose one or the other as the basis of tabulation for most of the vital-statistics compilations. The United Nations[7] recommendation on this matter is as follows:

"409. *Tabulation by place of occurrence and place of residence*

"(*a*) Final tabulations for geographic areas less than the total national territory and for cities, should be made according to place of usual residence. In addition, such place-of-occurrence tabulations as are required for administrative or other purposes should be made.

"(*b*) Determination of 'place of residence'* for purposes of tabulation should be made as follows:

Live births, Foetal deaths, Infant deaths	Place of residence of mother
Deaths	Place of residence of decedent
Marriages	Place of residence of groom
Divorces	Place of residence of husband

"(*c*) Tabulation of data for the national territory should relate in general to data on events occurring within the national boundaries, although under certain circumstances, as for example during war years, provision may need to be made for including in the national tabulations data for deaths among the armed forces stationed outside the national boundaries.

"(*d*) Special consideration should be given to obtaining corresponding population figures for the computation of rates.

"* The definition of 'residence' upon which the allocation of vital events to place of residence is made should not be a legalistic one but one which will allow vital statistics to be related to corresponding population data."

On a national basis, in normal times, the difference between the population present at any time in the country and the population resident of that area is relatively small. This is so because international travel is usually restricted to members of business, military, or diplomatic missions, to tourists or similar groups. None of these groups contributes in large numbers to either mortality or natality and in total, moreover, they are likely to be small in relation to the whole population of a country. Because the numbers involved are relatively small in comparison with the total, and because of the difficulties of arranging for international transfer or allocation of reports on vital events to the country of residence, it has become customary to consider the vital events occurring within the national boundaries as a good approximation to those occurring among residents of the country.

During war years, when a sizable proportion of the population may be outside the boundaries of the national territory yet under direct control of a national governmental agency, it may be advisable for some purposes to arrange for the allocation of records to place of residence, i.e., to the national territory, thus making possible the compilation of truer "resident" figures on a national basis. Such a decision will depend on the numbers involved and the duration of the absence and will only be required at times when international population movement is abnormal. In normal

[7] *Ibid.* p. 18-19.

times, tabulations for a national territory should be based on the events which occurred among the population present within the national boundaries.

Coming to subnational geographic units, however, the demographic or public-health worker is faced with a real and common problem. In many subnational geographic areas, there are incentives to extensive internal population movement of a temporary nature. One city or county may have finer hospitals and better trained doctors than its neighbour. The natural tendency will be for sufferers from certain diseases to go to the neighbouring area seeking medical assistance. Prospective mothers may take advantage of better facilities to have their babies away from their usual place of residence. Such interchange is particularly large from rural to urban areas, the urban centres attracting mothers, ill persons and, by virtue of the location of courts, divorcees. The problem which arises in relation to statistics is one of interpretation. Should all the births which occur in an area be counted in that area and, therefore, contribute to the birth rate of the area, despite the fact that the births occurred there only because the mothers came to take advantage of the care given by an outstanding maternity hospital? Likewise, shall all the deaths from tuberculosis (or any other disease) be charged to a geographic area in which an exemplary TB hospital happens to be located? For demographic or public-health purpose, such statistics would present a distorted picture, not readily interpretable. Place-of-residence tabulations recommended in Principle 409 will eliminate this bias from the statistics.

It should be noted that the United Nations Principle, specifying as it does the fundamental premise that final tabulations for less-than-total area should be by place of residence, does not preclude the making of place-of-occurrence tabulations for these same areas. As a matter of fact, the first and basic tabulation to be made is usually one for small geographic areas, on the basis of place of occurrence. Such a tabulation provides the check totals for the other tabulations and, moreover, supplies natality and mortality data on which medical and public-health administrators can determine the volume of medical care for which services should be supplied.

Although "occurrence-residence" problems are usually considered of importance in connexion with natality and mortality, they may also affect marriage and divorce statistics to some extent. Divorce tabulations are not particularly useful on a small geographic-area basis, inasmuch as their "place of occurrence" is fixed by the location of the court. The judicial authorities may wish to know the potential case load of a certain court and, for this purpose, place-of-occurrence statistics would be adequate. But for purposes of demographic or social analysis, they would be erroneous. For this reason, divorce statistics should either be computed on a residence basis or, preferably, studied for rather large political units or for the country as a whole. A similar situation exists with marriages. The place of occurrence of a marriage is to some extent fixed by law. It may be the place of residence of the bride or of the groom, the definition of "residence" varying from jurisdiction to jurisdiction. On the other hand, the place where a marriage is performed may be determined by fashion or convenience. For these reasons, nuptiality rates by place of occurrence could be misleading unless the determining factors are known. Place-of-residence tabulations tend to produce more meaningful marriage statistics.

The allocation of events to "place of residence" presents the parallel problem of how to determine "residence" for each vital event, and how to define a resident for purposes of the tabulations.

Determination of residence. Whatever the national definition of a resident may be, there must also be a decision as to how to determine "residence" in respect of a live birth, a stillbirth, a foetal death, and so forth. For simplicity and to promote comparability, certain international conventions have been accepted in this field, and they are embodied in Principle 409 given above. It will be seen from the Principle that in natality tabulations, it is customary to use as the reference point the place of residence of the mother. Likewise, for foetal and infant deaths, the mother's residence is the basis of tabulation. The justification for this procedure is readily seen. An infant being born, a dead foetus being delivered, or a young child dying has itself no usual place of residence. It may, therefore, be counted according to either the residence of its father or that of its mother. Because of the problems introduced by illegitimacy and the consequent absence of data on the father, it is obviously more convenient to make use of the data relevant to the mother. Another reason for so doing, of course, is that the factors influencing the birth, the delivery, or the infant death are primarily those connected with the mother and her surroundings.

For mortality tabulations other than infant deaths, it is the usual practice to tabulate according to the place of residence of the deceased. For nuptiality, the place of residence of the groom is chosen for convenience, although in some instances, additional tabulations are made on the basis of the residence of the bride. Likewise with divorces, the place of residence of the husband, assumed to represent the established residence of the family unit, is generally used as the reference point.

Definition of residence. The legal definition of residence is a difficult and complex one, varying according to national and local law. "Residence" in the legal sense may be determined by property ownership, by registration in a population register, by length of stay in the locality, and so forth. As stated in Principle 409, the definition adopted for the statistical purposes mentioned above should not be the legalistic one but one which will permit the relation of vital events to corresponding population groups for the computation of rates. Because of its necessary national variation, no international definition of "residence" is feasible.

D. The tabulation programme

Tabulation may be defined as "the counting of units in each category of a specific classification scheme and the systematic arrangement (seriation) of the results in such tabular form as will serve the needs of the investigation".[8] A tabulation programme is a systematic outline of the various tabulations to be compiled, describing them in terms of the event and the variables for which classifications and cross-classifications are to be

[8] *Ibid.* p. 25.

made. The objectives as shown by the tabulation programme can, obviously, be achieved by a number of different procedures, depending upon the type of equipment to be used and other factors. Accordingly, in any application, the tabulation programme must be supplemented by a specific set of operating specifications or procedures which show the exact sorts and counts to be made and the sequence in which these are to be performed.

The tabulation programme must be distinguished also from the publication programme with which it sometimes tends to be confused. A tabulation programme might provide, for example, for the counting of all events in the place where they occurred, i.e., in each geographic subdivision of the country, thus establishing a reference tabulation against which other counts may be checked. Such a tabulation could be published in its entirety, but it is unlikely that it would be expedient to do so. Similarly, a tabulation programme might be designed on the master-table basis in which a large number of items are cross-classified to provide the basis for a comprehensive analysis of interrelationships. Such a tabulation, if it involved more than a few items, would be almost impossible to print on the conventional page with the usual type-sizes. It could, however, provide several summarized tables for publication. A publication programme must take account of page size, type size, cost of printing and binding, as well as the needs of the potential consumer. The tabulation programme indicates the type of cross-classifications required, disregarding the form of their publication. This is not to say, however, that there is no relationship between a tabulation programme and a publication programme. Quite the contrary. The tables for publication will necessarily be drawn from the tabulation results and, in designing both the tabulation and publication programme, this fact must be borne in mind in order that the transfer from "tabulation" to "table" will be as easy as possible.

1. Annual tabulation programme

Conceivably, a tabulation programme designed for a certain number of items of information would be limited in extent only by time, money, and the ingenuity of the person planning the programme. Every item of information on the statistical report could be cross-classified and tabulated by every other item, creating a "master table" of prohibitive proportions or a series of separate classifications. However, this approach is obviously impractical. If more than three or four items are involved, the "master table" would defeat the goal of "data condensation" and the resulting tabulation would be both too intricate and too costly to be practicable. Numerous independent classifications, on the other hand, would result in a large number of simple tabulations, some of which would be meaningful in a limited sense while others would be useless.

The alternative to these two extremes is to select certain items for cross-classification with a definite idea of their use in mind. The selection of the items to be tabulated and the classifications and cross-classifications to be made must rest on the judgment and decision of the responsible officials. However, the ultimate value of the tabulation programme will depend on how well it has been based on an accurate appraisal of national and international needs for data.

(a) *International recommendations*

To assist countries in achieving a more objective and sound decision on the scope and content of their vital-statistics tabulation programme, the United Nations has proposed in Principle 410[9] a set of "desirable basic tabulations" and some suggestions designed to supplement this programme.

Principle 410 sets forth not only a suggested annual tabulation programme but also the concepts which underlie the choice of a tabulation programme, some of which have already been touched upon above. These include the basic premise that a tabulation programme should first meet national needs; only secondarily should such a programme seek to meet international needs, although it is recommended that at all times the achievement of international comparability should be a goal. The tabulations should describe — and to the extent possible explain — the incidence, the characteristics, time trends, and geographical differentials of births, deaths, stillbirths, marriages, and divorces, in such a way as to facilitate exploration of the pertinent interrelationships. The practical necessity of making the best possible use of available data, the feasibility of the desired tabulations on an annual basis, the practicability of making the tabulations with the facilities and equipment at hand, and the suitability of the tabulations as a source of tabular data for publication — all of these basic questions must be considered before a tabulation programme is adopted.

It must be emphasized that a tabulation programme, such as that set forth in Principle 410, does not establish the sequence in which the various tabulations should be made. Nor does it provide the detailed specifications for carrying out the work. Such specifications will depend on the volume of records involved and the processing methods to be used. Obviously, a country in which many types of mechanical equipment are available to the vital-statistics office will be able to carry through a specified tabulation programme in a manner quite different from that employed in another country in which such facilities are not present. The number of card passes required to obtain a certain tabulation is an important factor when the volume of reports is large; in the absence of mechanical facilities, country "A" may tend to make simple cross-classifications, while country "B" would develop tabulations of greater complexity.

The choice of items in the proposed basic tabulation programme has been determined by Principle 308 in which items to be included on the statistical reports have been divided into two categories — priority 1 and priority 2. The first-priority items, those upon which the basic tabulation programme has been formulated, are as follows:

[9] *Ibid.* p. 19-23.

Table F. First-priority items recommended for inclusion in statistical reports of live birth, death, foetal death, marriage, and divorce

Live birth	*Death*	*Foetal death*	*Marriage*	*Divorce*
Date of occurrence	Date of occurrence	Date of occurrence	Date of occurrence	Date of occurrence
Date of registration	Date of registration	Date of registration	—	—
Place of occurrence	Place of occurrence	Place of occurrence	Place of occurrence	Place of occurrence
Place of residence of mother	Place of residence	Place of residence of mother	Place of residence of bride and groom	Place of residence of divorcees
Sex	Sex	Sex	—	—
Legitimacy	Cause	Legitimacy	Date of birth	Date of birth
Type of birth	Certifier	Type of birth	Previous marital status	Date of marriage
Date of birth of mother	Date of birth	Date of birth of mother		Number of dependent children
Number of children born to mother		Number of children born to mother		
Attendant at birth		Period of gestation		

Other items which have been recommended for collection in Principle 308, as well as optional items which are considered of regional or national interest, are not included in the basic programme set forth below.[10]

"410. *Annual tabulation programme for national and international purposes*

"(*a*) The annual tabulation programme for national and international purposes should provide data in such classifications as are required for national study of the incidence, time trends and geographical differentials of the most important characteristics of fertility, mortality, nuptiality, and divorce, and the exploration of their interrelationships. It should also seek to meet the requirements of international agencies and, in general, be in agreement with the recommendations for achieving international comparability.

"(*b*) The design of the tabulation programme should take into consideration the maximum utilization of information available, the desirability of the tabulations, the practicability of performing the counting operations, using the tabulation facilities ordinarily available to the statistical services of the countries, and the suitability of the arrangement for deriving tables for presentation.

"(*c*) A suggested basic annual programme for the tabulation of live births, deaths, foetal deaths, marriages and divorces, including suggested standard classification schemes, is given in paragraph (*e*) below. This programme, which makes use of only the first priority (*) items in Principle 308, consists of tabulations which are of major general importance for purposes of demographic analysis. However, it should not be overlooked that vital statistics of a country are more useful to that country and for general scientific purposes if they are tabulated in relation to the significant social and economic groups which are identified within the country . . . The basic tabulation programme in paragraph (*e*) does not include such tabulations, and many countries will wish to compile their vital statistics also in relation to other variables given in paragraphs (*b*) and (*d*) of Principle 308 and by 'urban-rural' groupings or for localities classified by size, etc.

"(*d*) It is emphasized that the tabulations outlined below do not constitute a working programme of operating specifications. The manner in which these data are to be obtained from the tabulations will vary according to the types of equipment available. Hence, in designing operating specifications, these suggested tabulations of data will need to be combined in such a way as to obtain the maximum utilization of equipment at hand. Neither are the suggested tabulations a publication programme because it may not be desirable to publish annually all of the classifications indicated below, or it may be inexpedient to publish the data in these forms. Therefore, these tabulations represent only the cross-classifications and counts which are considered desirable for an annual programme in each country."

Tabulations No. 1 to No. 29 which follow comprise the recommended annual programme which is contained in paragraph (*e*) of Principle 410.[11] For convenience, the geographic classification suggested in general terms in para. (*e*) has been set forth in detail for each tabulation and — for conformity with the extended tabulation programme (p. 180) — an explanatory text, which is not part of the Principle, has been inserted.

Tabulation No. 1

LIVE BIRTHS CLASSIFIED BY PLACE OF OCCURRENCE
Classification
Place of occurrence: country as a whole,
each major civil division,
each geographic unit smaller than the major civil division,
each very important city.

This tabulation will serve as a check for geographic-area totals by place of occurrence.

Tabulation No. 2

RESIDENT LIVE BIRTHS CLASSIFIED BY ATTENDANT AT BIRTH
Classifications
Geographic: country as a whole,
each major civil division,
each geographic unit smaller than the major civil division,
each very important city.

[10] Some suggestions for tabulations utilizing the second-priority items will be found beginning on page 179.

[11] *Principles for a Vital Statistics System, op. cit.*

Attendant: physician, midwife, nurse, other, not stated.

This tabulation gives birth data for the computation of the resident-birth rates in geographic subdivisions and shows the extent to which the population of each area had medical-obstetrical services. In order to make full use of the information derived from the classification by "attendant", it would be desirable also to know where the births were occurring. An additional tabulation which showed live births in place of occurrence by those resident and those not resident and hospitalization by attendant, would provide information for the study of the relative need for maternity-care facilities in small geographic subdivisions.

Tabulation No. 3

RESIDENT LIVE BIRTHS CLASSIFIED BY MONTH OF OCCURRENCE
Classifications
Geographic: country as a whole,
each major civil division,
each very important city.
Month of occurrence: calendar month.

This tabulation provides the information upon which studies of seasonal variations in the birth rate may be made. With an additional classification by sex, it would provide information required in the preparation of monthly estimates of resident population by sex.

Tabulation No. 4

RESIDENT LIVE BIRTHS CROSS-CLASSIFIED BY SEX AND LEGITIMACY
Classifications
Geographic: country as a whole,
each major civil division,
each very important city.
Sex: male, female.
Legitimacy: legitimate, illegitimate, not stated.

The classification of live births by legitimacy will be of use primarily on a national basis, but the geographic differentials may have sociological implications. Further cross-classifications by items such as age of mother, birth order, occupation of mother, etc., are required before certain types of detailed analyses are possible.

Tabulation No. 5

RESIDENT LIVE BIRTHS CROSS-CLASSIFIED BY AGE OF MOTHER AND LIVE-BIRTH ORDER
Classifications
Geographic: country as a whole,
each major civil division,
each very important city.
Age: under 15 years, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and over, not stated.
Live-birth order: 1st, 2nd, 3rd, 4th . . . 10th and over, not stated.

"Age of mother" combined with "live-birth order" provides fundamental data for the study of changing natality patterns over a period of years. The limitations of the birth-order computations to those live births which occurred in the present marriage might, because of the memory factor and other considerations, give a more precise result. The demographer is more interested, however, in the total live-born additions to the population. The aim is, therefore, to provide a live-birth order computed on all live-born issue, including illegitimate children as well as legitimate children of the present or previous marriages.

Tabulation No. 6

DEATHS CLASSIFIED BY PLACE OF OCCURRENCE
Classification
Place of occurrence: country as a whole,
each major civil division,
each geographic unit smaller than the major civil division,
each very important city.

This, like Tabulation No. 1, is a reference tabulation, but it also gives local data of importance from the standpoint of administrative medicine.

Tabulation No. 7

DEATHS CLASSIFIED BY PLACE OF RESIDENCE OF DECEDENT
Classification
Place of residence: country as a whole,
each major civil division,
each geographic unit smaller than the major civil division,
each very important city.

A reference tabulation for comparison with results of No. 6, and for computation of resident death rates. Such local tabulations are of value for administrative purposes and for the study of geographic differentials in mortality.

Tabulation No. 8

RESIDENT DEATHS CROSS-CLASSIFIED BY MONTH OF OCCURRENCE AND SELECTED CAUSES OF DEATH
Classifications
Geographic: country as a whole,
each major civil division,
each very important city.
Month of occurrence: calendar month.
Causes of death: selected underlying causes.

Certain causes of death have seasonal variation; this tabulation is designed to evaluate that variation. In order to be most useful in this context, the causes should be classified according to the 3-digit, detailed categories of the International Statistical Classification of Diseases, Injuries, and Causes of Death. Grouped causes would not reveal seasonal variation upon which preventive programmes might be based. If, in addition to month and cause, the factor of "sex" is introduced, the resulting tabulation would, like Tabulation No. 3, provide information required for preparation of monthly population estimates by sex.

Tabulation No. 9

DEATHS CROSS-CLASSIFIED BY SEX, AGE, AND CAUSE
Classifications
Geographic: country as a whole.
Sex: male, female.
Age: under 1 year, 1, 2, 3, 4, 5-9, 10-14, 15-19, 20-24, 25-29 . . . 85 and over, not stated.
Cause of death: Intermediate List of 150 Causes.

This is the classic cause-of-death tabulation by age and sex, which will reveal the basic mortality facts. Some countries might wish to tabulate the entire 3-digit detailed list of the International Statistical Classification instead of the Intermediate List of 150 Causes but, unless the volume is very great, the 150-cause list will yield information of sufficient detail for most general purposes and will not result in frequencies of extremely small magnitudes. The age classification suggested is in accord with World Health Organization recommendations and with the recommended census tabulations, thus ensuring that rates may be calculated at least for census years.

Tabulation No. 10

RESIDENT DEATHS CROSS-CLASSIFIED BY SEX, AGE, AND CAUSE
Classifications
Geographic: country as a whole,
each major civil division,
each very important city.
Sex: male, female.
Age: under 1 year, 1-4, 5-14, 15-24, 25-34 . . . 65-74, 75 and over, not stated.
Cause: Abbreviated List of 50 Causes.

This tabulation is similar to No. 9 above, but because it is designed for geographic subdivisions of the country, a more condensed age classification and cause-of-death list is proposed. Some countries may wish to use the 5-year age groups proposed in Tabulation No. 9, as well as the 150-cause list rather than the Abbreviated List of 50 Causes. The tabulation as set forth here is a minimum.

Tabulation No. 11

RESIDENT DEATHS CROSS-CLASSIFIED BY TYPE OF CERTIFICATION AND CAUSE
Classifications
Geographic: country as a whole,
each major civil division,
each very important city.
Type of certification: medical, other, not stated.
Cause: Intermediate List of 150 Causes.

The evaluation of the accuracy of cause-of-death data depends on knowledge of the type of certification involved. This tabulation is basic to the understanding of the reliability of the data, and it may be desirable to extend it to a more detailed cause classification. In some circumstances, the classification of type of certification might also be more valuable if extended (see page 127).

Tabulation No. 12

INFANT DEATHS (UNDER 1 YEAR OF AGE) CLASSIFIED BY PLACE OF OCCURRENCE
Classification
Place of occurrence: country as a whole,
each major civil division,
each geographic unit smaller than the major civil division,
each very important city.

This is the place-of-occurrence reference tabulation for infant deaths. For crude-rate computation, these data can be related to birth statistics from Tabulation No. 1.

Tabulation No. 13

INFANT DEATHS (UNDER 1 YEAR OF AGE) CLASSIFIED BY PLACE OF RESIDENCE OF MOTHER
Classification
Place of residence: country as a whole,
each major civil division,
each geographic unit smaller than the major civil division,
each very important city.

This is the basic residence tabulation for computing infant mortality rates for small geographic areas. Tabulation No. 2 will provide the live births required as the basis for computation of rates.

Tabulation No. 14

RESIDENT INFANT DEATHS (UNDER 1 YEAR OF AGE) CROSS-CLASSIFIED BY AGE AND MONTH OF OCCURRENCE
Classifications
Geographic: country as a whole,
each major civil division,
each very important city.
Age: under 28 days, under 1 year, not stated.
Month of occurrence: calendar month.

Neo-natal mortality rates, as well as seasonal variation in infant mortality, can be derived from this tabulation. In accordance with the definition of "early infancy" in the International Statistical Classification of Diseases, Injuries, and Causes of Death, neo-natal mortality is equated to "under 28 days" rather than to a calendar month. A more detailed age classification might also reveal variations of significance.

Tabulation No. 15

RESIDENT INFANT DEATHS (UNDER 1 YEAR OF AGE) CROSS-CLASSIFIED BY SEX AND AGE
Classifications
Geographic: country as a whole,
each major civil division,
each very important city.
Sex: male, female.
Age: under 1 day, 1, 2, 3, 4, 5, 6 days; 7-13, 14-20, 21-27, 28 days to under 2 months; 2, 3, 4 . . . 11 months; not stated.

This tabulation provides the most detailed classification of infant age at death in the basic tabulation pro-

gramme, a classification in accord with the World Health Organization recommendation for special statistics of infant mortality by age. This day-, week-, and month-of-age classification will serve as a basis for the analysis of age variations in the infant-death rate and in particular for mortality during the first week. It will also provide data for examining the sex ratio of mortality at these ages.

Tabulation No. 16

RESIDENT INFANT DEATHS (UNDER 1 YEAR OF AGE) CLASSIFIED BY CAUSE OF DEATH
Classifications
Geographic: country as a whole,
each major civil division,
each very important city.
Causes of death: selected underlying causes.

Sex, detailed age, and cause of infant death are the fundamental elements for the study of infant mortality. Whether they are separately tabulated as indicated in this and Tabulation No. 15 or whether these two tabulations are combined into one master table (see p. 181), the results will give the basis for a thorough study of infant-mortality problems. The causes of death will be those categories of the Detailed List which are of special importance in relation to infant mortality.

Tabulation No. 17

FOETAL DEATHS CLASSIFIED BY PLACE OF OCCURRENCE
Classification
Place of occurrence: country as a whole,
each major civil division,
each very important city.

This is the reference place-of-occurrence tabulation for foetal deaths.

Tabulation No. 18

RESIDENT FOETAL DEATHS CROSS-CLASSIFIED BY SEX AND PERIOD OF GESTATION
Classifications
Geographic: country as a whole,
each major civil division,
each very important city.
Sex: male, female, not stated.
Period of gestation: under 20 completed weeks,
20-27 completed weeks,
28-36 completed weeks,
37 completed weeks and over,
not stated.

This is the tabulation which distinguishes "early" (under 20 weeks' gestation), "intermediate" (20 and under 28), and "late" (28 weeks and over) foetal deaths, in accordance with the standard recommended by the World Health Organization for measurement of the magnitude of foetal loss at various gestational ages. In addition, it provides a means of distinguishing foetal deaths according to the criterion of "prematurity", as measured by a period of gestation of less than 37 completed weeks.

Tabulation No. 19

RESIDENT LATE FOETAL DEATHS CROSS-CLASSIFIED BY SEX AND LEGITIMACY
Classifications
Geographic: country as a whole,
each major civil division,
each very important city.
Sex: male, female, not stated.
Legitimacy: legitimate, illegitimate, not stated.

Because of the incompleteness of foetal-death registration in general, and in particular at the earlier durations of gestation, restriction of this tabulation to "late" foetal deaths should provide more accurate data than a tabulation of foetal deaths of all gestational periods. Until registration of foetal deaths improves considerably, "late foetal deaths" will provide the most comparable basis and will, in many cases, have the added advantage of continuity with the former series of "stillbirth" statistics. The corresponding live-birth tabulation for computation of stillbirth ratios is Tabulation No. 4.

Tabulation No. 20

RESIDENT LATE FOETAL DEATHS CROSS-CLASSIFIED BY AGE OF MOTHER AND TOTAL BIRTH ORDER
Classifications
Geographic: country as a whole,
each major civil division,
each very important city.
Age: under 15 years, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and over, not stated.
Total birth order: 1st, 2nd, 3rd, 4th . . . 10th and over, not stated.

To improve international and historical comparability, this tabulation, like No. 19, is based on late foetal deaths. Variation in late foetal-death incidence by age of mother can be investigated using data resulting from this tabulation and Tabulation No. 5. Variation in the incidence of foetal deaths at different birth orders may also reflect a public-health problem. If foetal deaths are occurring most often to women at the higher birth orders, it may be indicative of detrimental physiologic or other factors. Foetal-death ratios specific for total-issue birth order is the index which would give the most appropriate information. It should be noted that the base for computation of such ratios is live births tabulated by total-birth order — a tabulation suggested in the extended programme, p. 180.

Tabulation No. 21

CONFINEMENTS CROSS-CLASSIFIED BY TYPE OF BIRTH AND STATUS OF ISSUE WITH RESPECT TO BEING BORN ALIVE OR DEAD
Classifications
Geographic: country as a whole,
each major civil division,
each very important city.
Type of birth: single, twin, triplet, quadruplet, etc., and not stated.
Status of issue: Single —live birth,
foetal death;

Twin —2 live births,
1 live birth and 1 foetal death,
2 foetal deaths;
Triplet—3 live births,
2 live births and 1 foetal death,
1 live birth and 2 foetal deaths,
3 foetal deaths;
and so forth.

"Confinements", as used here, is synonymous with "deliveries", "maternities", or "total cases of birth". The number of confinements is the same as the number of individuals (liveborn or stillborn) in the case of single births, but is of course less than the total number of live births plus foetal deaths in the case of plural issue, inasmuch as the term refers to the "sets" of twins or triplets.

This tabulation, which makes use of the type-of-birth item, allows a detailed study of plural births to be made, including not only the incidence of each type but, more important, the composition of each set in terms of being liveborn or stillborn. If the factor of prematurity is added (see classification proposed on p. 148), the tabulation becomes even more interesting.

Tabulation No. 22

RESIDENT[12] MARRIAGES CLASSIFIED BY MONTH OF OCCURRENCE
Classifications
Geographic: country as a whole,
each major civil division,
each very important city.
Month of occurrence: calendar month.

The seasonal variation in the marriage rate in different geographic areas will be revealed by this tabulation.

Tabulation No. 23

RESIDENT MARRIAGES CROSS-CLASSIFIED BY AGE OF BRIDE AND AGE OF GROOM
Classifications
Geographic: country as a whole,
each major civil division,
each very important city.
Age: under 15 years, 15-19, 20-24, 25-29 . . . 75 and over, not stated.

The age of the participants in the marriage is of great importance from a demographic viewpoint. The age classification suggested will allow rates to be computed on corresponding census data.

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[12] Tabulations should be made by residence of the bride as well as by residence of the groom. A place-of-occurrence tabulation of marriages has not been included in the minimum programme because, in many countries, the law provides that marriages must take place where at least one of the participants resides and, in fact, this is the customary procedure. In any case, a tabulation by occurrence would seem to fill no essential purpose, unless there are important administrative uses for such data.

Tabulation No. 24

RESIDENT MARRIAGES CROSS-CLASSIFIED BY PREVIOUS MARITAL STATUS OF BRIDE AND PREVIOUS MARITAL STATUS OF GROOM
Classifications
Geographic: country as a whole,
each major civil division,
each very important city.
Previous marital status: single, widowed, divorced (or equivalent). In addition, "married" for males if polygamy is allowed.

This tabulation provides information on some of the changes which are occurring in the marital status of the population — information which can be used together with that on deaths by marital status in the estimation of population in intercensal years. In conjunction with corresponding census data, it provides information for the computation of marriage rates specific for marital status which may throw light on important sociological and economic patterns of marriage and remarriage.

Tabulation No. 25

MARRIAGES CROSS-CLASSIFIED BY PREVIOUS MARITAL STATUS AND AGE OF PARTICIPANTS. [TABULATE SEPARATELY FOR BRIDE AND FOR GROOM.]
Classifications
Geographic: country as a whole.
Marital status: Single, widowed, divorced (or equivalent). In addition, "married" for males if polygamy is allowed.
Age: under 15 years, 15-19, 20-24, 25-29 . . . 75 and over, not stated.

The introduction of "age" into the "previous-marital-status" tabulations gives even more information as to the marriage pattern, with its implications on natality. Although the tabulation is recommended only for the country as a whole, it may be useful at subnational levels too. The age classification will allow age-specific rates to be computed for each marital-status group.

Tabulation No. 26

DIVORCES CLASSIFIED BY PLACE OF OCCURRENCE
Classification
Place of occurrence: country as a whole,
each major civil division,
each very important city.

The place of occurrence of a divorce, especially if compared with the place of residence of the divorcees, provides useful information which may have legal or other connotations and which may be a factor in the determining of laws regarding divorce residence requirements and so forth.

Tabulation No. 27

RESIDENT DIVORCES CROSS-CLASSIFIED BY AGE OF WIFE AND AGE OF HUSBAND
Classifications
Geographic: country as a whole,
each major civil division,
each very important city.

Age: under 15 years, 15-19, 20-24, 25-29 . . . 75 and over, not stated.

This tabulation gives demographic information on marriage dissolution by geographic areas and contributes to the understanding of the age factor in relation to divorce.

Tabulation No. 28

DIVORCES CROSS-CLASSIFIED BY DURATION OF MARRIAGE AND AGE OF DIVORCEES. [TABULATE SEPARATELY FOR HUSBAND AND FOR WIFE.]

Classifications

Geographic: country as a whole.

Age: under 15 years, 15-19, 20-24, 25-29 . . . 75 and over, not stated.

Duration of marriage: under 1 year, 1, 2, 3, 4, 5, 6, 7, 8, 9 years, 10-14, 15-19, 20 years and over, not stated.

The age of divorcees is of sociologic significance, especially if cross-classified with "duration of marriage". The age distribution, in accordance with census recommendations, would permit direct relationship to population-census data for computation of age-specific divorce rates. If married population tabulated by age and duration of marriage is available, the specific rates throw some light on the relationship between age at marriage and liability of divorce.

Tabulation No. 29

DIVORCES CROSS-CLASSIFIED BY NUMBER OF DEPENDENT CHILDREN AND DURATION OF MARRIAGE

Classifications

Geographic: country as a whole.

Number of dependent children: none, 1 child, 2 children . . . 7 and over, not stated.

Duration of marriage: under 1 year, 1, 2, 3, 4, 5, 6, 7, 8, 9 years, 10-14, 15-19, 20 years and over, not stated.

The number of dependent children affected by a divorce action is of interest primarily to welfare authorities who must be aware of, and provide for, the problems which arise from this situation. The relationship of number of children and duration of marriage may give some clue to the "type" of marriage being dissolved, i.e., whether families being broken up by divorce differ appreciably from others as revealed by the corresponding tabulation of births by duration of marriage and birth order.

2. SOME SUGGESTIONS FOR AN EXTENDED TABULATION PROGRAMME

The first-priority items which gave rise to the basic annual tabulation programme set forth above were listed on p. 174. In Principle 308,[13] a number of other items of information were suggested for inclusion in the statistical reports and, in addition, a number of optional items were mentioned such as "religion", "origin", "country of birth", "nationality", and so forth. Various tabulations utilizing these characteristics are possible. In addition, other tabulations based on the first-priority items could be suggested. As emphasized previously, a choice must be made, taking into account all the special national factors and needs as determined by outstanding demographic or public-health problems. Nevertheless, certain combinations of items suggest themselves as being of general interest, and these have been set forth below.

This extended tabulation programme is not intended to be an exhaustive or comprehensive set of tabulations but rather a limited list of suggestions for consideration in relation to national needs and the quality of national data. Suggested tabulations are not given for all second-priority items for each event. In some instances, improvement may be necessary in the information collected, before tabulations, other than those of an experimental type, are justified. In other cases, items are of value for specific research-type investigations rather than for general tabulation.

Neither is the extended programme intended to be an "annual" programme. Some of the suggested tabulations, specifically those involving occupation, industry, literacy, and the like, might be useful only around the year for which population census results are available. On the other hand, they may not be inclusive enough to meet the special *ad hoc* needs for purposes of demographic research during the census period.

In so far as they may be desirable or feasible for national purposes, all of the suggested combinations of items are designed to supplement, not replace, Basic Tabulations Nos. 1-29 given on p. 174-179. Desirability in this sense involves consideration of the quality of the national data. For example, the foetal-death tabulations (Nos. V-Z) are recommended only for areas with relatively satisfactory reporting of foetal deaths — those areas in which the tabulations might be expected to form the basis of a preventive programme. If the national data do not meet this criterion, it may be desirable to limit foetal-death tabulations to data for selected population groups. Even for areas which have satisfactory reporting, reliability may be increased by restricting the tabulations to "late foetal deaths".

Because of the many national factors which have a bearing on the development of a specific tabulation programme, the classification schemes to be used in connexion with the following suggestions are not indicated. In so far as geographic characteristics are concerned, it would appear that the suggested tabulations would be most useful if they were made for (1) the country as a whole, (2) each major civil division, and (3) each important city. However, it might also be desirable to make certain tabulations, such as "live births by resident and non-resident, hospitalization and attendant" for geographic units smaller than major civil divisions. On the other hand, some of the suggested tabulations, as for example those involving occupation and industry, might be made only for large geographic units or for the country as a whole. The needs of each country will be the determinant.

The geographic detail required will naturally have a bearing on the choice of the classification schemes used for other variables. If it is decided that the geographic variable is not important in relation to certain cross-classifications, it may be advantageous to combine two or more of the tabulations suggested below, modifying the attribute-classification schemes as necessary for practical purposes. For these reasons, it does not appear useful to suggest specific schemes.

[13] *Principles for a Vital Statistics System, op. cit.* p. 11.

The suggested list of second-priority tabulations are as follows:

Tabulation A

LIVE BIRTHS IN PLACE OF OCCURRENCE CLASSIFIED AS RESIDENT OR NON-RESIDENT, AND CROSS-CLASSIFIED BY HOSPITALIZATION AND ATTENDANT

As mentioned in relation to Basic Tabulation No. 2, this cross-classification of hospitalization and attendant in place of occurrence gives information useful for the evaluation of the utilization of medical-care facilities and resources. To be most useful, such evaluation needs to be made for small geographic areas. For this reason, it is suggested that the geographic classification for this tabulation include at least the geographic unit smaller than the major civil division. On this "small-area" basis, the tabulation also provides information on the geographic variation in the proportion of non-residents among total recorded births.

Tabulation B

RESIDENT LIVE BIRTHS CROSS-CLASSIFIED BY WEIGHT AT BIRTH, ATTENDANT AND HOSPITALIZATION

This tabulation is recommended for advanced programmes and is intended to provide information for the study of natality by weight. The cross-classification by attendant and hospitalization will give some indication of the probable accuracy of the weight information and also determine the proportion of prematurely born infants attended by a physician, nurse, or midwife. It should be noted that although a class limit of 2,500 grammes must be maintained to define "prematurity", it is not necessary to adopt the detailed 500-gramme classification. Consolidation into 1,000- or 1,500-gramme intervals would be adequate for this tabulation.

Tabulation C

RESIDENT LIVE BIRTHS CROSS-CLASSIFIED BY WEIGHT [OR, IF NOT AVAILABLE, PERIOD OF GESTATION] AND OCCUPATION OF MOTHER

The influence that occupation of mother may have on the premature delivery of a live-born child may be studied from this tabulation. Prematurity should be defined if possible by birth weight but, if this characteristic is not available, period of gestation may be used (see p. 142, chapter X). The inaccuracies and underreporting of occupation, weight, and period of gestation may invalidate the tabulation for many areas but, where reporting is not grossly deficient, it may produce useful results.

Tabulation D

RESIDENT LIVE BIRTHS CROSS-CLASSIFIED BY WEIGHT AT BIRTH AND PERIOD OF GESTATION

Results of this tabulation will help to reveal the relationship between period of gestation and birth weight, information required to obtain a statistical basis for a more satisfactory definition of prematurity. The tabulation may also provide a basis for distributing "not stated" birth weights. For both these purposes, a more detailed birth-weight classification would be required than is needed for Tabulation B.

Tabulation E

RESIDENT LIVE BIRTHS CROSS-CLASSIFIED BY TOTAL-BIRTH ORDER AND AGE OF MOTHER

A tabulation of total-birth order and age is required to form the base for computation of foetal-death ratios specific for age of mother and birth order.

Tabulation F

RESIDENT LIVE BIRTHS CROSS-CLASSIFIED BY AGE AND LITERACY [OR LEVEL OF EDUCATION] OF PARENTS. [TABULATE SEPARATELY FOR MOTHER AND FOR FATHER.]

These tabulations would ordinarily be prepared only at the population-census year when detailed population data are available, or for several years centred around the census date. In conjunction with the census, it provides data necessary for measuring levels of fertility in broad age groups according to level of education or literacy. However, some countries may desire to prepare these tabulations annually to serve as a base for foetal-death ratios specific for these characteristics.

Tabulation G

RESIDENT LIVE BIRTHS CROSS-CLASSIFIED BY LEGITIMACY, AGE OF MOTHER AND AGE OF FATHER

The relationship of age of parents and legitimacy may provide information useful in combating illegitimacy. This tabulation will also provide data upon which birth rates specific for age of mother and/or father and legitimacy may be calculated.

Tabulation H

RESIDENT LIVE BIRTHS CROSS-CLASSIFIED BY AGE OF FATHER AND OCCUPATION OF FATHER

The variation of levels of fertility in various occupational groups will provide some indication of socio-economic differentials. The classification of occupation should be in accordance with the international standard (see p. 131).

Tabulation I

RESIDENT LIVE BIRTHS CROSS-CLASSIFIED BY AGE OF FATHER AND STATUS OF FATHER (AS EMPLOYER, EMPLOYEE, ETC.)

This tabulation provides another measure of socio-economic status in relation to fertility and its variations according to age of father.

Tabulation J

RESIDENT LIVE BIRTHS CROSS-CLASSIFIED BY LIVE-BIRTH ORDER, DURATION OF MARRIAGE, AND AGE OF MOTHER

The number of children born in relation to the number of years of marriage and age will provide information of special interest to demographers for the calculation of legitimate reproduction and replacement rates.

Tabulation K

DEATHS IN PLACE OF OCCURRENCE CLASSIFIED AS RESIDENT OR NON-RESIDENT, AND CROSS-CLASSIFIED BY HOSPITALIZATION AND CERTIFICATION

This tabulation provides an index of the relative use for medical-care facilities in different geographic sub-

divisions, and the geographic variation in the quality of cause-of-death certification. Both of these measures are most useful in terms of small geographic areas. For this reason, it is suggested that the geographic classification for this tabulation include geographic subdivisions smaller than the major civil division. Similar to Tabulation A, this provides a means of measuring the proportion of non-resident deaths occurring in an area.

Tabulation L

RESIDENT DEATHS CROSS-CLASSIFIED BY SEX, AGE, AND MARITAL STATUS

For the investigation of mortality by marital status, this tabulation ordinarily would be done only at the population-census period. However, some countries may wish to use the basic frequencies for construction of intercensal population estimates according to marital status and, for this purpose, it would be required annually. A more complex tabulation, but one of great interest, would result if the cause-of-death variable were introduced.

Tabulation M

RESIDENT DEATHS OF MARRIED PERSONS CROSS-CLASSIFIED BY SEX, AGE OF DECEDENT, AND AGE OF SURVIVING SPOUSE

This tabulation provides information from which the average age of widows and widowers and widowhood rates specific for age, may be computed. It also provides a part of the information required for studying the age distribution of married couples.

Tabulation N

RESIDENT DEATHS CROSS-CLASSIFIED BY AGE, SEX, AND LITERACY [OR LEVEL OF EDUCATION]

When corresponding population data are available, this tabulation would supply the information required to measure levels of mortality according to a cultural or social variable, i.e., literacy or level of education, whichever is collected on the statistical report.

Tabulation O

RESIDENT DEATHS BY SEX, AGE, AND STATUS (EMPLOYER, EMPLOYEE, ETC.)

Like Tabulation N above, this distribution of deaths will provide the data required for the computation of age-status specific death rates at the census year, which will give a measure of the relation between status and mortality at various ages.

Tabulation P

RESIDENT DEATHS CROSS-CLASSIFIED BY SEX, AGE, OCCUPATION, AND CAUSE OF DEATH

Tabulation P is recommended only for countries with advanced statistical programmes. It would provide information that could be utilized, for the period around the census year when population bases are available, to measure levels of mortality in broad occupational-age groups. In addition to the information necessary for an analysis of the variation in mortality rates specific for age and occupation, this tabulation would throw light on the relationship between occupation and cause of death which is of great interest from the medical and economic viewpoints.

Tabulation Q

RESIDENT DEATHS CROSS-CLASSIFIED BY SEX, AGE, INDUSTRY, AND CAUSE OF DEATH

Like Tabulation P, this tabulation is suggested for industrialized countries where occupation and industry are diverse enough to warrant an analysis of cause of death in relation to them. These data, related to corresponding population available for the census year, will provide cause-of-death rates specific for age and industry which may be useful in studying the problems of industrial hazards in specific communities.

Tabulation R

RESIDENT FEMALE DEATHS CROSS-CLASSIFIED BY AGE AND NUMBER OF LIVE-BORN ISSUE

This tabulation provides information on the completed reproductive experience of groups of women. The "completion" of their experience is due to termination of the child-bearing period by age, or by death during the reproductive period. For women in the child-bearing ages, these data are superior to those derived from incompleted experience obtained in conjunction with the census of population. Moreover, such information can be made available annually through tabulations of this type, thus providing information for computation of average number of children born to a cohort of women, the proportion of women who remain childless, and so forth. The introduction of the cause-of-death variable may provide additional interesting information on the incidence of various causes in relation to the child-bearing history.

Tabulation S

RESIDENT INFANT DEATHS CROSS-CLASSIFIED BY YEAR OF BIRTH, SEX, AND AGE

This tabulation is recommended for the years around the census date in order to provide information necessary for the calculation of life tables. It is also useful during periods of major fluctuations in the birth rate in order to provide data required for calculation of the refined infant mortality rate, which relates infant deaths to the corresponding group of live births. (See chapter XIII, p. 191.)

Tabulation T

RESIDENT INFANT DEATHS CROSS-CLASSIFIED BY SEX, AGE, AND LEGITIMACY

The relative incidence of infant mortality at various ages and according to legitimacy is of interest for public-health and welfare purposes.

Tabulation U

RESIDENT INFANT DEATHS CROSS-CLASSIFIED BY DETAILED AGE, SEX, AND CAUSE OF DEATH

This is the master table which supplies the most important elements for a study of infant mortality. It should be noted that it would take the place of both

Tabulations Nos. 15 and 16 of the basic programme, inasmuch as it combines the elements of each. The causes to be tabulated would be selected on the basis of their importance in relation to infant mortality.

Tabulation V

FOETAL DEATHS IN PLACE OF OCCURRENCE CLASSIFIED AS RESIDENT OR NON-RESIDENT AND CROSS-CLASSIFIED BY HOSPITALIZATION AND TYPE OF CERTIFICATION

This, like Tabulations A and K, provides information for analysis of the quality of the foetal-death reports as indicated by type of certification and the utilization of medical facilities for delivery. Since this type of information is required for small geographic areas, the tabulation should be made for each geographic division smaller than the major civil division.

Tabulation W

RESIDENT FOETAL DEATHS CROSS-CLASSIFIED BY PERIOD OF GESTATION AND OCCUPATION OF MOTHER

Using Tabulation C as a base, foetal-death ratios specific for occupation of mother may be calculated, for the analysis of the influence of mother's occupation on foetal mortality at various gestational ages.

Tabulation X

RESIDENT FOETAL DEATHS CROSS-CLASSIFIED BY WEIGHT AT DELIVERY AND PERIOD OF GESTATION

The investigation of the relationship between period of gestation and weight of the foetus has been suggested by the World Health Organization for the purpose of obtaining a statistical basis for a more satisfactory definition of "prematurity". The tabulation will also be useful in calibrating the accuracy of reports on weight and gestational age.

Tabulation Y

RESIDENT FOETAL DEATHS CROSS-CLASSIFIED BY SEX, PERIOD OF GESTATION, AND CAUSE OF DEATH

The causes of foetal death require intensive study by period of gestation in order that a basis may be found for the development of measures required to reduce foetal-death wastage.

Tabulation Z

RESIDENT FOETAL DEATHS CROSS-CLASSIFIED BY LEGITIMACY AND AGE OF MOTHER

With this tabulation and G above, foetal-death ratios specific for age of mother may be calculated to throw light on the influence of age on the risk of delivering a dead foetus.

Tabulation AA

RESIDENT MARRIAGES CROSS-CLASSIFIED BY LITERACY [OR LEVEL OF EDUCATION] OF BRIDE AND GROOM

Socio-economic variation in the marriage rate, as measured by the literacy or level of education of the partners in the marriage, can be determined from this tabulation and the corresponding census data.

Tabulation BB

RESIDENT MARRIAGES CLASSIFIED BY OCCUPATION OF GROOM

Like literacy or level of education, occupation is a characteristic indicative of socio-economic status, and this type of tabulation may reveal significant differentials.

Tabulation CC

RESIDENT MARRIAGES CROSS-CLASSIFIED BY NUMBER OF PREVIOUS MARRIAGES OF BRIDE AND NUMBER OF PREVIOUS MARRIAGES OF GROOM

This tabulation will indicate the extent to which new marriages are taking place and, therefore, the number of new demographic families. Conversely, it will show whether the marriage rate includes an appreciable number of re-entries of previously married persons into the married state.

Tabulation DD

RESIDENT DIVORCES CROSS-CLASSIFIED BY LITERACY [OR LEVEL OF EDUCATION] OF DIVORCEES

This tabulation provides information on the relation of literacy or level of education to the tendency to divorce.

Tabulation EE

RESIDENT DIVORCES CROSS-CLASSIFIED BY OCCUPATION OF HUSBAND AND OCCUPATION OF WIFE

From data in this tabulation, one may investigate the relation between broad occupation groups and divorce and study the possible effect on the divorce rate of the employment of women outside the home.

Tabulation FF

RESIDENT DIVORCES CROSS-CLASSIFIED BY NUMBER OF PREVIOUS MARRIAGES OF HUSBAND AND NUMBER OF PREVIOUS MARRIAGES OF WIFE

Information on the relationship of divorce and the order of the marriage being dissolved is of interest for sociological reasons.

3. INTERESTING TABULATIONS WHICH DEPEND ON "MATCHING"

The relationships between neo-natal or infant mortality and certain characteristics of live births are sources of information valuable for the understanding of some of the factors affecting mortality. Since it is not usually feasible to include on the infant-death report all the information pertaining to the mother and to the birth itself, some countries make special studies by matching infant or neo-natal death reports to the corresponding live-birth report, and consolidating the relevant information. On the basis of a consolidated statistical report of this type, it is possible to make various special mortality tabulations and studies involving many factors, among which may be mentioned the following:

age of father
age of mother
attendant
birth order
cause of death
economic characteristics of parents
hospitalization
literacy or level of education of parents
period of gestation
type of birth
weight at birth

4. Tabulations for local needs

Another facet of a tabulation programme not covered in the first- and second-priority tabulations presented above is the need for prompt local-area statistics. By the nature of the processes involved, it is usually impracticable for the central or national service to provide tabulations for small areas on a time schedule current enough to be most useful. Therefore, provision must be made for some authority other than the national service to provide such summaries, and this responsibility is usually delegated to the district or state registrar himself, or to the local health unit. Total counts of death from communicable disease, for example, should be in the hands of public-health workers as soon after occurrence as possible and, in any case, no less than at weekly intervals. Moreover, the planning and evaluating of public-health programmes depend on such local-area tabulation. It is essential, therefore, that provision to obtain or supply such tabulations be made. The United Nations Principle[14] on this point is as follows:

"412. *Provision of tabulations to meet local needs*

"(*a*) The national tabulation programme carried out by a national office of vital statistics may need to be supplemented by summary tabulations, made at the local or regional level by the services concerned, which would have as their objective the prompt provision of information on subjects requiring immediate administrative action.

"(*b*) Provision should be made at the national level to provide, on request, detailed geographic tabulations which may not be included in the routine national tabulation programme."

[14] *Ibid.* p. 23.

CHAPTER XIII

COMPUTATION OF RATES AND INDICES

A. Absolute numbers — uses and limitations of

The tabulation programme set forth in chapter XII will result in a series of frequencies of live births, deaths, foetal deaths, marriages, and divorces classified according to certain characteristics. These absolute numbers have numerous uses for administrative purposes and as elements of various computations such as those made in estimating population.

The administrative uses of numbers of vital events, either as totals or as subtotals resulting from cross-classification by selected characteristics, are based on the fact that these frequencies represent the number of persons born, deceased, married, or divorced during a specified period of time. For example, in public-health administration, that is, in planning and providing public health for a community or even for a country as a whole, the number of mothers giving birth each year helps to determine the magnitude of the maternal and child-care programmes; the number of deaths determines the number of caskets and the amount of services required for interment; the number of deaths from a contagious disease indicates the resources required to combat the disease and the amount of serum needed to immunize the population. In connexion with other programmes, such as education and housing, the number of births in any one year helps to determine school- and house-building programmes. In connexion with hospitals, the number of deaths and births occurring in hospitals helps to ascertain the number of beds required in certain areas. These are but a few illustrations of the various administrative uses of absolute frequencies.

For computations such as the estimation of population, the absolute numbers of births represent additions to the population, while the numbers of deaths are the deletions. With these two factors, plus data on migratory movements, it is possible to estimate total population and with these components subdivided according to characteristics such as age, marital status, and so forth, it is possible to construct estimates of population according to these attributes.

However, useful as absolute frequencies are, many of the interpretations of vital statistics depend upon the relationship between various frequencies, or upon relating the frequencies of a vital event to the size of the population in which these events occurred. Such relative numbers make it possible to compare the incidence rate of vital events for population groups of various sizes. Many types of relative numbers have been used in the analysis of vital statistics. The more common ones are defined and discussed below.

B. Relative numbers — rates and ratios

According to the Oxford Dictionary, a "relative" number is one "proportioned to something else". A "rate" is defined in the same source as a "statement of numerical proportion prevailing . . . between two sets of things", while the Webster Dictionary states that a rate is the "quantity or degree of a thing measured per unit of something else". Oxford defines a ratio as "the quantitative relation between two similar magnitudes determined by the number of times one contains the other integrally or fractionally". It is obvious from these definitions that rates and ratios are "relative numbers" and that the requirements for computation are "two sets of things".

In applying the above definition of a rate to vital statistics, we can consider as one of the "sets of things" the number of vital events and as the other the population in which the vital events occurred. Many authors have defined vital-statistics rates as "probability numbers", i.e., an expression measuring risk or chance in the statistical sense. Probability rates would be of great value because they could be interpretable in easily understood terms. However, not all conventional vital-statistics rates can be interpreted in probability terms or considered even as approximations to a probability. Because of this, no attempt will be made in this *Handbook* to discuss the various theoretical aspects of this subject. For the reader who may wish to follow the subject further, some of the points have been set forth in *Vital Statistics Rates in the United States, 1900-1940.*[1] Reference is made there also to other works in the field such as Rietz,[2] Pearl,[3] and Whipple,[4] among others.

For purposes of this *Handbook* it may be said that, for most analytical uses, vital-statistics frequencies must be converted into "relative numbers" or "rates" by relating the absolute numbers to some base figure or "population". Further, it may be pointed out that for most of the rates the "population" to which the events are related must "correspond", or in other words, should be, as nearly as possible, the actual population group in which the events occurred or the population exposed to the risk of the event recorded. The degree to which the traditional vital-statistics rates conform to this condition will be pointed out below.

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[1] *Vital Statistics Rates in the United States, 1900-1940,* by Forrest E. Linder and Robert D. Grove. Federal Security Agency. Public Health Service. National Office of Vital Statistics. Gov. Print. Off., Washington, 1947. 1051 p.

[2] *Mathematical Statistics* by Henry Lewis Rietz. Open Court Publishing Co., Chicago, 1927.

[3] *Introduction to Medical Biometry and Statistics* by Raymond Pearl. Third ed. W. B. Saunders Company, Philadelphia, 1941. 537 p.

[4] *Vital Statistics—An Introduction to the Science of Demography* by George Chandler Whipple. Second ed. John Wiley and Sons, Inc., New York, 1923.

Ratios are often used in the national analysis of vital statistics, some of the more common applications being the ratio of deaths from one cause to the total from all causes; the ratio of male to female births, i.e., "masculinity"; the ratio of plural to total births, and so forth. Although this index has specific and useful applications, it should be noted that it can often give fallacious results, especially in comparing the experience of one year with that of another in the same community. For these reasons, it is more often supplanted by the "rate" which is of greatest importance.

1. Components of rates

(a) *Numerator*

In the previous chapter, it was recommended that tabulations of vital events be made for each geographic area by calendar periods, i.e., months, quarters, or years as required. Vital events occur continuously and, theoretically, their registration and reporting for statistical purposes also takes place continuously. At specified times during the year, the statistical authorities "count up" the events reported to have occurred during a specified time period within certain geographic limits. This establishes the "incidence" of the event during that time period in the area under study. These "counts" provide the numerator of the rate discussed above — the "one set of things" which is to be related to another.

(b) *Denominator*

The "other set of things" is usually the population of the area which gave rise to the event or some approximation to that population. However, population usually is not recorded continuously. In most countries it is recorded accurately only at the time of the population census, and may be estimated for the beginning and the middle of the calendar year and, sometimes, also by month.[5] By its very nature, therefore, the population count or estimate is not an incidence figure but one representing a situation at one moment of time. The problem for the vital statistician is to determine the population figure which best "corresponds" to the frequencies of the vital events.

(c) *Correspondence of numerator and denominator*

The numerator of the rate, that is, the number of vital events, will be defined according to (1) the character of the event in question, (2) the geographic area to which the event belongs, and (3) the time period within which it occurred. The population to which the events are related in computing a rate should "correspond" to the numerator in all three aspects.

Adherence to the principle of correspondence between the vital events and the population base requires that the two series of data — vital statistics and population census or estimate — be defined, classified and tabulated in exactly the same manner. For many reasons, it is not always possible to achieve this aim precisely and, as a result, the numerator and the denominator are sometimes not exactly comparable. So long as the divergencies are recognized and acknowledged, the computed rates are useful for many purposes, but ignorance or disregard of lack of correspondence can result in meaningless or misleading rates. The three aspects to be considered are discussed below.

In respect of character. With respect to the character of the event, the population must be such that the event in question could be drawn from it. For example, if it is desired to compute a rate measuring the chance of death from puerperal causes, it would not be proper to include the male population in the base; should it be desired to compute birth rates for a certain occupation group, the population base should consist of that segment of the total population which is classified as having the occupation in question.

In respect of area. The area to which the rates refer is defined both by the geographic boundaries and by the constitution of the population group involved. The establishment of geographic limits presents no problem, it having been determined in the tabulation programme. The population, however, may be constituted of those persons present in the area, or those resident of the area.

Tabulation by place of occurrence versus place of residence has been discussed at length in chapter XII. Suffice to say here that the choice in so far as rates are concerned depends on the uses to which they will be put. The important criterion is that in this respect as in others the numerator and denominator be comparable in so far as it is possible to make them so.

It should be noted that any of the formulae presented later in this chapter may be adapted to an occurrence or a residence rate by defining more specifically the type of population group involved.

In respect of time. Several estimates of population may be considered for the denominator of a rate, such as (1) an estimate which refers to the beginning of the time period, (2) one which refers to the midpoint of the period, (3) one which relates to the end of the period, and (4) the arithmetic mean population computed on the basis of other component estimates.

The population at the beginning of any time period represents that from which the first vital event to occur in the period was drawn, but immediately thereafter, the "exposed population" will have changed — it will have been decreased or increased by the event in question and by subsequent events in the time period. Therefore, the computation of a rate using the population at the beginning of the period will usually result in one which tends to be overstated.

The use of the population estimate for the end of the period has the reverse effect. It represents the effect of the events which have occurred, that is, the population remaining after the subtraction of deaths and emigrants and the addition of births and immigrants. Depending on conditions, this estimate may be somewhat too low or too high.

The more correct figure is one which closely represents the average population exposed to risk throughout the period. Either the mean or a midpoint estimate approximately meets this requirement. Of these two, the mean would, theoretically, offer the best solution, because it would take account of any large changes in the rate of growth of the population of an

[5] In countries which maintain a current population register, it may be possible to obtain estimates at more frequent intervals. See *Methods of Estimating Total Population for Current Dates,* Manual I of Manuals on Methods of Estimating Population. United Nations. Department of Social Affairs, Population Division. Document ST/SOA/Series A/10, 1952. 45 p. (Sales No. 1952.XIII.5)

area brought about by migration or other causes. But, unfortunately, the computation of the mean population requires a series of estimates made at regular intervals throughout the period, such as a series of monthly estimates or, at least, beginning- and end-period figures. The end-period estimate cannot be made until the conclusion of the period in question, thus delaying the availability of the required average figure. In view of this, the midpoint estimate appears to be the most acceptable. Accordingly, most annual vital-statistics rates are computed using a population figure referring to 1 July.

All of the above discussion is applicable primarily to "annual" rates. Should the time period be less than one year, it is customary to facilitate comparison by adjusting the rates to an annual basis. Adjustment is achieved by multiplying the monthly rate by a factor which consists of the number of days in the year divided by the number of days in the period in question. For example, if the tabulation of vital events is for one calendar month of 31 days, the adjustment factor would be computed as follows:

$$\frac{365}{31} = 11.7742$$

The use of this factor would make the monthly rate, or any rate for a different time period adjusted in a like manner, comparable to an annual rate.

(d) *The constant*

For convenience in expression, it is usual to multiply by a constant the proportion obtained when the numerator of the rate is divided by the denominator. Simply relating the number of vital events to the population almost always would result in a rate of less than unity. Therefore, for ease in understanding and recording, it is customary to multiply the proportion by a constant which for most rates is 1,000. Thus, vital-statistics rates are in general expressed "per 1,000 population". An exception is the cause-of-death rates in which, because of the small numerator (deaths from selected causes) and the large total population figure, the rates are usually calculated "per 100,000 of population".

In spite of the frequent lack of significance of the last digit, vital-statistics rates are customarily published to one decimal place.

2. Types of rates

In general, it may be said that there are two types of vital-statistics rates — crude rates and specific rates. As their names imply, the two types differ from each other in specificity. Crude rates, sometimes known also as "general" rates, "global" rates, "total" rates, and "gross" rates, are those computed with respect to the total population, without regard to any specific characteristic of that population. They are rates which measure the proportion prevailing between the number of events under consideration and the total population — or in terms of probability, the chance that the event being considered will occur in the total population.

Rates defined in terms of one or more characteristics of the population are known as "specific rates". Any characteristic of the population may be the basis for a specific rate. Those found most useful and feasible are "age", "sex", "birth order", "occupation", "marital status", and the like. Using the criterion of type of population base to distinguish crude from specific rates permits generalization in the application of formulae.

(a) *Crude rates*

The general formula for a crude rate irrespective of the vital event to which it refers is as follows:

$$\text{Crude rate} = \frac{\text{Number of vital events which occurred among the population of a given geographic area during a given period}}{\text{Midperiod total population of the given geographic area during the same period}} \times 1{,}000$$

As noted previously, and evident in the formula, the crude rate must be defined in terms of "character of the event", "area" and "time period".

(b) *Specific rates*

The general formula for a rate specific for some characteristic of the population may be expressed as follows:

$$\text{Specific rate} = \frac{\text{Number of vital events which occurred among a specific group of the population of a given geographic area during a given period}}{\text{Midperiod population of the specified group in the given geographic area during the same period}} \times 1{,}000$$

As in the case of the crude rate, the components of the specific rate must be defined in terms of character of the event, area and time period, but in addition the specific rate must be characterized by its reference to only one special segment of the population as, for example, specific age groups, selected occupation groups, and so forth.

An additional element which must be considered in the computation of a specific rate is the size of the "unknown" category in the distribution. As has been pointed out in the tabulation programme (chapter XII), most frequency distributions according to a specified classification scheme will include a category for which the characteristic is unknown. In computing rates specific for a certain characteristic, the problem becomes one of choosing between ignoring this category and limiting rates to the "knowns", or to eliminating the unknown group by distributing it among the "knowns". No general recommendation can be made on this point. The choice depends on the magnitude of the frequencies in the unknown category of each attribute classification and upon what is known concerning the basic problems of recording and reporting the information under study. If the unknowns are few, they may be ignored in the computation of the specific rates; if on the other hand they are relatively numerous, it may be necessary to reconsider the advisability of computing specific rates unless some satisfactory distribution method can be devised. Disproportionately large numbers of unknowns can invalidate a distribution, and care must be taken to avoid computing rates which may be subject to large errors from this source.

In the discussion of various specific rates beginning on p. 187, the problem of the disposition of "unknowns" is mentioned when it is evident that a sizable problem may exist. In all other cases, the problem should be examined in relation to each separate tabulation.

C. Live-birth rates and ratios

1. Crude live-birth rate

The simplest and most usual live-birth rate is the one which relates all the live births which occurred among a given population to that population total. Such a rate is known as the "crude live-birth rate". The formula is as follows:

$$\text{Annual crude live-birth rate} = \frac{\text{Number of live births which occurred among the population of a given geographic area during a given year}}{\text{Midyear total population of the given geographic area during the same year}} \times 1{,}000$$

The crude live-birth rate cannot be interpreted as an approximate probability number because the population base (including all ages and sexes) is not the population exposed to the risk of giving birth. Rather, the crude live-birth rate is an index to the relative speed at which additions are being made to a population through childbirth and, as such, is a composite measure of all the factors affecting natality in the population under study—the age composition, the economic level, and true fertility.

The crude live-birth rate alone should not be used to compare the fertility level in two populations, because it does not take account of variations in the structure of the population, especially in respect of the female age-composition, and this factor may distort the rates for comparative purposes. Crude birth rates can be of value, however, in indicating in a general way variations between populations. They establish the general magnitude of the rates for the areas being compared and, for any one area, they are of value in depicting the broad outlines of time trends. In spite of their limitations, they are perhaps the most widely used of vital-statistics birth rates because of their general availability.

2. Age-limited birth rate

Although the crude birth rates will show the general trend over time and the approximate levels of natality among different geographic areas, a rate based on the population which more closely corresponds to the group "exposed to risk" is more meaningful for certain purposes, especially for international or inter-area comparisons. The numerator of the refined rate would remain the same as the crude rate, but the denominator would be limited to the age-sex group of the population able to contribute to the birth rate. The formula for such a rate, known as the "age-limited live-birth rate" is given below in terms of the female population:

$$\text{Annual age-limited live-birth rate (also known as a "fertility" rate)} = \frac{\text{Number of live births which occurred among the population of a given geographic area during a given year}}{\text{Midyear female population of ages 10 to 49 in the given geographic area during the same year}} \times 1{,}000$$

This "age-limited" rate is actually the "total rate" for the age-specific-rate distribution (see 3 below), inasmuch as it relates all live births to the total group of the population contributing to the total natality. Since it takes cognizance of the broad age structure of the population, this type of rate is more comparable between geographic areas as well as over time.

The "age-limited" birth rate as set forth above restricts the population base to females of certain age groups. A further refinement is sometimes introduced — that is, to compute the rate from live births to married women and a married-female population base of certain ages. Although such a rate is more exact in its specificity, it is less useful from a general demographic viewpoint. Especially is this so from the standpoint of international comparability. The concepts of marriage and legitimacy vary a great deal from one culture to another, and limitation of this rate by a concept dependent on legal interpretation would lessen its utility for demographic or public-health analyses. Therefore, it is recommended that for most purposes the age-limited live-birth rate be based on all live births related to the total female population which is within the child-bearing or reproductive ages. It is, of course, possible to limit the numerator of the rate to live births occurring to females of ages 10-49, but since these ages encompass virtually the entire range of child-bearing years, this limitation is not considered necessary.

It should be noted that the age-limited birth rate and its modifications may also be formulated in terms of the male population, in which case it is usual to limit the denominator to ages 15 to 64 years.

3. Age-specific birth rate

The live-birth rates which form the cornerstone of demographic analysis are the age-specific live-birth rates. These are the rates which take account of the age-sex composition of populations and which, therefore, provide the best basis for international comparisons of natality. They are also very useful in analysing the historical trend of the live-birth rate for the various ages. The formula for any age-specific birth rate is as follows:

$$\text{Annual live-birth rate specific for age of mother or father} = \frac{\text{Number of live births which occurred to mothers or fathers of a specified age group of the population of a given geographic area during a given year}}{\text{Midyear female or male population of the specified age group in the given geographic area during the same year}} \times 1{,}000$$

The total rate for "births at all ages" is based on female population 10-49 and male population 15-64.

The computation of this rate for age of mother (or father) is subject to one special difficulty, namely the disposition of the frequencies in the "unknown-age" category of the distribution. Large frequencies in this category may indicate that many of the reported births are illegitimate, the birth records for which tend to be less complete than those for legitimate births. Because it is known that illegitimate births are more numerous at the younger ages of the child-bearing span, to distribute the unknown ages proportionate to the known ages would introduce an error. If the age distribution of live births by age of mother is tabulated also by legitimacy, a more accurate allocation of ages can be made for the "unknowns". If this is not possible, it is customary to distribute the unknowns proportionate to the known ages, irrespective of the possibility of error.

The problem of the disposition of unknown ages will probably be less serious for live-birth rates by age of father if the data are limited to legitimate births, as is usually done. If the rate is based on all births, both legitimate and illegitimate, the problem of the unknowns is serious.

The "unknown" age group for the population base is usually less significant relatively than the unknown age of father or mother, and it is not necessary to distribute it. However, if the unknowns should constitute a sizable proportion of the total they may be distributed proportionately to the various ages.

4. Other specific birth rates

In addition to age, birth rates can be made specific for other characteristics such as parity, duration of marriage, occupation of father, and so forth. As an example, the formula for the rate specific for parity or birth order is set forth below:

$$\text{Annual live-birth rate specific for live-birth order} = \frac{\text{Number of live births of a given birth order which occurred among the population of a given geographic area during a given year}}{\text{Midyear female population of the corresponding parity group in the given geographic area during the same year}} \times 1{,}000$$

The true probability rate for birth order described above takes account of the fact that only those women who are primiparous could contribute to first-birth orders; only those who have already borne one child can contribute to the second-birth order group, and so forth. Such rates are difficult to compute, however, because corresponding populations are not available except at the census period, and only then, if a specific question on "fertility" is included for the female population.[6] Therefore, the birth "rate" for birth order is usually computed simply on the total female population 10 to 49 years of age. Rates computed in this simplified manner make possible comparisons over time within the same country and, on an international basis, they permit rough comparisons, inasmuch as they take account of variations in the proportion of child-bearing population in each country.

In computing this rate the disposition of unknown birth orders may be a problem if the frequency is large. Consideration should be given to tabulating the orders by legitimacy in order to arrive at a more accurate method of allocation.

5. Birth ratios (proportionate natality)

For certain purposes, it may be found desirable to compute a ratio of one or more subgroups of live births to total live births, e.g., masculinity, or to calculate the percentage distribution of live births according to some characteristic. This latter application has not found such broad application for natality as it has for mortality; because of the more general applications in the latter field, the discussion of the limitations of ratios (or percentages) has been set forth in connexion with "death ratios" on p. 192. The sections below deal with several examples of this measure in the field of natality, the general formula for which is as follows:

$$\text{Annual birth ratio} = \frac{\text{Number of live births with a particular characteristic which occurred among the population of a given geographic area during a given year}}{\text{Total number of live births which occurred among the same population during the same year}} \times 100$$

(a) *Birth ratio specific for parity*

In the absence of female population by parity required to compute the "live-birth rate specific for birth order (parity)" as recommended above, the ratio or percentage by parity is sometimes used for analytical purposes. Ratios such as these provide a means of analysing the patterns of parity in a somewhat different way than rates specific for parity. The ratio, however, does not afford a good means of studying time trends except in so far as the *shape* of the parity distribution is concerned. The ratio formula specific for parity (birth order) would be as follows:

$$\text{Annual birth ratio specific for parity} = \frac{\text{Number of live births in each live-birth order which occurred among a population of a given geographic area during a given year}}{\text{Total number of live births which occurred among the same population during the same year}} \times 100$$

The treatment of unknown birth orders has been discussed in relation to the specific rate above.

(b) *Birth ratio specific for duration of marriage*

Some changes in the pattern of fertility may become evident from an analysis of the distribution of legitimate live births according to duration of marriage. Since estimates of the population exposed to risk of giving birth to children at the various marriage durations are not generally available, specific rates usually cannot be computed and analysis must depend on a type of "relative number" other than a "rate". The computation usually used is the birth ratio or percentage distribution, the formula for which would be as follows:

$$\text{Annual birth ratio specific for duration of marriage} = \frac{\text{Number of live births at each duration of marriage which occurred among the population of a given geographic area during a given year}}{\text{Total number of live births which occurred among the same population during the same year}} \times 100$$

In this computation, the "unknown duration" may be treated the same as any known-duration category, that is, a percentage may be computed for it. Because of the nature of the data, it is likely that many of the "unknown" durations are the result of a desire to conceal pre-marital conceptions. It would be incorrect, therefore, to distribute the "unknowns" proportionately and, on the other hand, it would not be correct to assume that they all belonged in the under-1-year group.

[6] For further discussion of the adjustment of reproduction rates for parity, see "Reproduction Rates Adjusted for Age, Parity, Fecundity and Marriage" by P. K. Whelpton. *Journal of the American Statistical Association*, Vol. 41, No. 236, Washington, 1946. p. 501-516.

D. Death rates and ratios

1. Crude death rate

The crude death rate, which measures the decrease in a population due to death, is perhaps the most widely used of any vital-statistics rate. This is so for two reasons. First, it is relatively easy to compute, requiring only total deaths and total population, and second, it has value as an index in numerous demographic and public-health problems. Within broad limits, the crude death rate represents the chance of dying for persons in the population. As such, it can be interpreted in terms of public health, since the incidence rate of death is the first approximate measure of the health status of a population.

The formula for the crude death rate, adapted from the general formula, is as follows:

$$\text{Annual crude death rate} = \frac{\text{Number of deaths which occurred among the population of a given geographic area during a given year}}{\text{Midyear total population of the given geographic area during the same year}} \times 1{,}000$$

Many authors have warned against the use of the crude death rate for inter-area comparisons. These warnings are based on the fact that mortality varies with age, among other things, and the crude rate which masks all age differentials may be misleading if the age-sex structures of the populations being compared are not similar. Populations composed of a high proportion of persons at the older ages where mortality is higher will naturally show a higher crude death rate than a "younger" population.

Under most circumstances, the crude death rate is valid for comparisons for the same area from year to year, since changes in the composition of the population of an area occur rather slowly. If the time trend is studied for a long period of years, however, the effect of population changes must be examined. Greater caution is necessary for comparisons between areas, since rather significant differences in crude death rates may arise entirely from differences in the age-sex distributions of the populations. However, where it is known that the population distributions are approximately similar, or where the crude rate differences are large, as in many international comparisons, the crude rate has great value as an index of mortality.

2. Cause-of-death rate

Rates computed for various causes of death may be considered as a form of crude or specific rate according to whether they are computed on the basis of the total population or a specific subgroup. Except for infant mortality by cause and some sex-specific rates, most death rates by cause are computed on total population. Thus, the formula for the crude cause-of-death rate may be set forth as follows:

$$\text{Annual cause-of-death rate} = \frac{\text{Number of deaths from a specified cause which occurred among the population of a given geographic area during a given year}}{\text{Midyear geographic total population of the given area during the same year}} \times 100{,}000$$

Since the numerators of the rates are often small frequencies, the above formula uses a constant of 100,000 rather than the usual 1,000 so that the computed rates are not expressed as small decimal fractions.

The death rate by cause is not a probability rate, because it relates deaths from a specified cause of death to the total population which may not necessarily be the population exposed to risk of death from that cause. For example, the total population is hardly exposed, during any one year, to the risk of death from causes such as arteriosclerosis, a disease which is primarily an ailment of advanced age. Nevertheless death rates for such a disease are compiled on population of all ages in the same manner as other cause rates because it is manifestly impossible to decide the age at which this cause may become operative. The crude cause-of-death rate does give an over-all index of the attrition of the total population due to this cause, and in spite of such shortcomings, it is perhaps the most important of all vital-statistics indices from the public-health viewpoint. It is the measure which constitutes the basis for many public-health programmes and which, in addition, measures the success or failure of these programmes.

In spite of the simplicity of its computation, the crude cause-of-death rate is subject to a number of qualifications. First, it disregards (as do all crude rates) the age-sex composition of the population. Secondly, its principal component is a characteristic — the reported cause of death — which is perhaps subject to the greatest degree of reporting error, its reliability being governed by the type of certification and the method of reporting, coding and classification. These problems have been discussed previously (chapter X), but they are mentioned here for emphasis and to warn against uncritical reliance on the meaning of the crude death rate by cause of death.

It may be noted that a more useful cause-of-death rate might result in some instances by limiting the denominator to males or to females, as appropriate, or to some specified occupation or industry group for example.

3. Maternal mortality rate

The maternal mortality rate may be considered as an alternative or more refined cause-of-death rate which measures the risk of dying from causes related to child-birth.

Obviously, both sexes of the population are not exposed to risk of death from this cause. Neither is all the female population exposed to such risk, because of the fact that child-bearing is limited to a specific age range. But neither are all females in the child-bearing age groups exposed to such risk. Actually, the population exposed to the risk of dying from a cause related to child-bearing consists of those women who have been pregnant at some time during the period. Under the assumption of a constant birth rate, this population is approximately the sum of mothers giving birth to live-born children and those being delivered of dead foetuses.

However, foetal deaths are universally poorly registered, and those of short gestational life are even less likely to be reported. Also, most countries do not tabulate "numbers of mothers" but rather "numbers of live

births", a figure slightly larger because of the cases of multiple birth. For these reasons, therefore, the "number of live births" has become the conventional base for the most comparable maternal mortality rates. The formula is:

$$\text{Annual maternal mortality rate} = \frac{\text{Number of deaths from puerperal causes which occurred among the female population of a given geographic area during a given year}}{\text{Number of live births which occurred among the population of the given geographic area during the same year}} \times 1{,}000$$

"Puerperal causes" in the above formula are defined as all those in "Chapter XI. Deliveries and Complications of Pregnancy, Childbirth, and the Puerperium", titles 640-689, of the International Statistical Classification of Diseases, Injuries, and Causes of Death.[7] This is one of the groups of causes of death which is subject to the greatest variations in coding and classifying. Within one country, there may be relative consistency in assigning the proper codes in a uniform manner. But international comparability is not easily achieved. Although the revised medical certificate of death and progress in reporting may have led to improvement, since that time, a study completed in 1934 revealed the extent of variation present in and around the 1929 period.[8] In the course of this study, 1,073 certificates of death coded in the United States during 1927 as "associated with pregnancy" were sent to 24 other countries with a request that the cause shown on each certificate be assigned to puerperal or nonpuerperal causes as appropriate. Sixteen countries[9] answered the survey and, from the results, it was evident that the methods used at that time (1929) in Australia, Netherlands, New Zealand, Scotland, and the United States were similar and the maternal mortality rates directly comparable, but that in other countries, a larger or a smaller number of deaths would be assigned to puerperal causes.

Another source of error in the maternal mortality rate is underregistration of the live births used in the denominator of the rate. Although deaths may be underregistered to some extent in most countries, it is doubtful that adult deaths would be subject to the same degree of underregistration as live births. If the number of live births in the denominator is less complete proportionately than the number of maternal deaths in the numerator, the maternal mortality rates will tend to be overstated to some degree. The effect of this overstatement, however, will be relatively minor. It would not account for wide variations in the rates.

[7] Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death; 6th revision of the International Lists of Diseases and Causes of Death adopted 1948, vol. 1 (World Health Organization, *Bulletin*, Supplement 1) Geneva, 1948. 376 p.

[8] *Comparability of Maternal Mortality Rates in the United States and Certain Foreign Countries; a study of the effects of variations in assignment procedures, definitions of live births and completeness of birth registration* by Elizabeth C. Tandy. Department of Labor. Children's Bureau. Publication No. 229. Gov. Print. Off., Washington, 1935. 24 p.

[9] Australia, Canada, Chile, Czechoslovakia, Denmark, England and Wales, Estonia, France, Irish Free State, Italy, Netherlands, New Zealand, Northern Ireland, Norway, Scotland, and Sweden.

4. Death rate specific for age

The general formula for this useful type of death rate is as follows:

$$\text{Annual death rate specific for age} = \frac{\text{Number of deaths which occurred among a specific age group of the population of a given geographic area during a given year}}{\text{Midyear population of the specified age group in the given geographic area during the same year}} \times 1{,}000$$

These rates measure the risk of dying in each of the age groups selected for the computation. Usually such rates are computed for the entire span of years, and are further specified by sex so that rates specific for age and sex are available. The specificity by age and sex eliminates the differences which would be due to variations in population composition in respect of these characteristics and, to this extent, such rates can be compared from one geographic area to another and from one time period to another. However, it does not eliminate other variables which also might be important. Significant variables which remain are those with socio-economic implications predisposing to death at certain ages, such as "occupation", "literacy", and the like. Nevertheless, for general analytical purposes, the death rate specific for age and sex is one of the most important and widely applicable types of death rates. It also supplies one of the essential components required for computation of net reproduction rates and life tables.

5. Death rates specific for other characteristics

Age and sex are only two, although the most common, of the characteristics for which specific death rates are computed. Death rates specific for marital status, for occupation, for urban-rural residence, for race, for religion, or any other characteristic are computed using a formula essentially the same as that set forth above, substituting for "age group" the "occupation", "religion", or "marital-status" group as required. The essential element of the formula, and the one upon which the validity of the specific rate rests, is that the numerator and the denominator should correspond in terms of the characteristic, such as "marital status", for which the rate is specific. This means, as noted previously, that the events in the numerator must derive from a similarly defined population in the denominator, that the two figures refer to the same time period and to the same geographic area.

6. Infant mortality rate

The infant mortality rate is similar to an age-specific death rate for infants under 1 year of age. In accordance with the general formula above, the denominator of the death rate specific for infants is the population under 1 year of age. However, it is well known that infants are usually underenumerated in the census of population; the use of this age group as a base for the death rate under 1 year results, therefore, in an overstatement of the rate. Moreover, estimates of population by age are not always available annually.

In spite of these difficulties, the age-specific rate for deaths under 1 year is frequently used, especially where rates are computed systematically for the whole range of age groups. For most other purposes the

infant mortality rate is used rather than the age specific rate. In the infant mortality rate the number of live births occurring during the period in question is usually substituted for the specific population group under 1 year of age. The formula thus becomes:

$$\text{Annual infant mortality rate} = \frac{\text{Number of deaths under 1 year of age which occurred among the population of a given geographic area during a given year}}{\text{Number of live births which occurred among the population of the given geographic area during the same year}} \times 1{,}000$$

The use of the number of live births during the time period as the base for the infant mortality rate has two distinct advantages. First, it immediately eliminates the dependence on population census or estimate data to which other rates are subject. This means that the *infant mortality rate* can be computed for any population or for any time period providing the number of infant deaths and live births are available for that area and time period. Infant mortality rates for small areas are possible, therefore, in spite of lack of population estimates, and rates for parts of years can be computed without use of adjustment factors.

Notwithstanding its advantages, it will be immediately apparent that the infant mortality rate is not a probability rate in the true sense, because the events in the numerator could not all have been drawn from the "population" in the denominator. Obviously, some of the deaths under 1 year of age in any year must have been of infants born in the previous year; these are not part of the denominator as set forth in the formula. This lack of consistency between the numerator and the denominator of the traditional infant mortality rate has been the subject of considerable study and investigation. Many methods of adjusting and compensating for the lack of agreement have been devised, and most of these are discussed in "The Measurement of Infant Mortality".[10]

Actually the effect of this discrepancy between the numerator and the denominator is not very important with respect to the level of the infant mortality rate in normal times. Even when the number of live births is fluctuating widely, the effect of computing the infant mortality rate by the conventional method introduces an error of rather small proportions. Other errors inherent in the components of the infant mortality rate are usually of such magnitude that this minor inexactness in the computation itself may be ignored.

The most serious errors in connexion with the infant mortality rate are probably those of definition and registration. In chapter IV, the variations in the definition of a live birth and a stillbirth were discussed and the potential effect of these variations on the total number of live births and infant deaths registered was indicated. Also, it was noted that there is a tendency of varying degrees to neglect to register as a live birth those infants who, though born alive, die immediately after birth. Thus, live births may be underregistered, while infant deaths are more completely registered — a situation which would result in infant mortality rates larger than the true ones. As pointed out by Falk,[11] ". . . without saving a single infant life it is possible to lower the infant mortality rate by improving birth registration". Thus, improvement in general birth registration without corresponding improvement in infant death registration would tend to show a misleading series of decreasing infant mortality rates.

Since the infant mortality rate is of such value, especially in the field of public health, its correct computation and interpretation is important. In most countries, the great risk of death at ages under 1 is not equalled again in the life span until very old age is reached. But in contrast to deaths at older ages, infant deaths are more responsive to improvement in environmental and medical conditions. Hence, infant mortality rates serve as one of the best indices to the general "healthiness" of a society.

7. Neo-natal mortality rate

The neo-natal mortality rate, like the infant mortality rate, is similar to an age-specific rate. It is a rate used to measure the risk of death during the first month of life.

The first problem in connexion with the neo-natal rate is that of defining "month". Actual practice varies according to the form in which age is reported. However, for purposes of the International Statistical Classification of Diseases, Injuries, and Causes of Death, "early infancy" has been defined as the first 28 days of life,[12] and this seems to be the most practical definition for neo-natal mortality also.

The second problem concerns the population base for the rate. Theoretically, the "population" exposed to the risk of death under one month of age would include those born in the calendar month of death and some proportion of those born during the previous calendar month. On an annual basis, deaths under 1 month in any one calendar year can only come from live births of that year plus those born in the previous December. Therefore, live births of the calendar year in question are considered a satisfactory approximation to the exposed-to-risk population for the neo-natal rate. The use of the total number of live births also makes the neo-natal rate analogous to the "infant mortality rate". Accordingly, the formula for a neo-natal mortality rate is:

$$\text{Annual neo-natal mortality rate} = \frac{\text{Number of deaths under 28 days of age which occurred among the population of a given geographic area during a given year}}{\text{Number of live births which occurred among the population of the given geographic area during the same year}} \times 1{,}000$$

In interpreting neo-natal rates, care must be taken to evaluate the probable effect of underregistration of live births in relation to infant deaths. It is likely that infant deaths under 1 month are registered less completely than any other infant deaths, and the two sources of incompleteness in the rate probably compensate for each other to some extent.

[10] "The Measurement of Infant Mortality" by W. P. D. Logan. *Population Bulletin of the United Nations.* Department of Social Affairs, Population Division. Document ST/SOA/Ser.N/3, October 1953. p. 30-67. (Sales No. 1953.XIII.8)

[11] *The Principles of Vital Statistics* by I. S. Falk. W. B. Saunders Company, Philadelphia, 1923. p. 74.

[12] Manual . . . *op. cit.* p. 212.

8. Infant mortality rate by age

The neo-natal mortality rate measures the risk of dying during the first month of life. In order to compare the risk involved during the first few days and weeks of life and during each of the remaining 11 months, the first year is often subdivided into "detailed age groups" (see recommended Tabulation No. 15, p. 176). The conventional method of computing a rate to measure the risk of death at these various infant ages is to relate the infant deaths by age in days, weeks, or months to the total annual number of live births. The formula is as follows:

$$\text{Annual infant mortality rate by age} = \frac{\text{Number of infant deaths which occurred at a specified age among the population of a given geographic area during a given year}}{\text{Number of live births which occurred among the population of the given geographic area during the same year}} \times 1{,}000$$

The infant mortality rate is the sum of these rates for all ages under 1 year. The neo-natal mortality rate is the rate for the specific age category of under 1 month. The death rate for the first-week category (under 7 days) is variously known as the "semanatal mortality rate" or the "hebdomadal death rate".

Attention should be called to the lack of precision which may occur as a result of the method used to compute the age interval. Ages, especially those under 1 week, must be carefully computed in exact periods of time elapsed, i.e., hours and days, in order to allocate the correct number of deaths to the "one-day" category, and other small age classes.

9. Death ratios (proportionate mortality)

This relative number is a percentage figure. Criticism of this index has usually had its origin in a lack of appreciation of the exact meaning and frequent erroneous use of death ratios. Proportionate mortality is not a substitute for the death rate and cannot be used for the purpose of evaluating the "level of mortality" or the "risk of dying". Its function is to show the numerical relation between deaths from one cause, group of causes, age, group of ages, etc., and the total number of deaths from all causes or all ages taken together. For this specific purpose, it has utility.

Although any segment of mortality constitutes a "proportion" of the total, two applications of this index are usually found. The most common is probably the "proportionate mortality or death ratio by cause" and the second "proportionate mortality by age". The general formula applicable to either of these is the following:

$$\text{Annual death ratio} = \frac{\text{Number of deaths with a particular characteristic which occurred among the population of a given geographic area during a given year}}{\text{Total number of deaths among the same population during the same year}} \times 100$$

Death ratios are subject to the same limitations in respect of interpretation as other percentage figures, but so long as they are kept in context, they can be used, for example, to study proportionate mortality over time. The danger of erroneous interpretation arises when they are by implication substituted for death rates, a possibility which will occur when they are computed primarily because population data for computation of rates are lacking. A good example of an *erroneous* application is given in *Vital Statistics Rates in the United States, 1900-1940*,[13] where the following table and comment is set forth:

Table G. Accident death rates and ratios specific for two age groups: United States, 1940

Age group (in years)	*Population enumerated April 1, 1940*	*Total deaths in 1940*	*Deaths from accidents (all forms) in 1940*	*Accident death ratio (number per 100 total deaths)*	*Accident death rate (number per 100,000 population)*
15-24	23,921,358	48,999	12,763	26.0	53.4
65-74	6,376,189	306,025	11,425	3.7	179.2

"From these data the computed death ratio for all forms of accidents is 26.0 for the younger ages of 15 to 24 years and only 3.7 for the older age group of 65 to 74 years. A hasty glance at these ratios may lead to the conclusion that accidents constitute a more serious risk to younger than to older people. However, if the age-specific death rate is computed — the figure which measures the risk of death from a given cause — it is immediately apparent that the risk of death from accidents is much greater for the older classes. The age-specific death rate for accidents is 53.4 for ages 15 to 24 years and 179.2 for ages 65 to 74 years. The high death ratio for ages 15 to 24 years in this case does not mean that the risk of death from accidents is high, but rather that the risk of death from other causes is low.

"The example given is an extreme case, but, inasmuch as certain causes of death are characteristic of certain age ranges, differences in death ratios for causes of death between occupational, racial, and other groups, may be due to differences in the age distribution of the compared populations."

E. Foetal-death rates and ratios

1. Crude foetal-death rate

It has been stated above that a logical base for the maternal mortality rate would be one comprising all pregnancies (all cases which could result in a maternal death). Similarly the foetal-death rate could be computed by relating the number of foetal deaths to the potential number, i.e., total pregnancies, or for convenience, the number of live births plus the number of foetal deaths.

However, for some time to come registration and reporting of foetal deaths will be incomplete in widely varying degrees in different countries. Therefore, it would seem advisable for the present to increase international comparability by computing the index of foetal deaths on the total number of live births alone,

[13] *Op. cit.* p. 50-51.

rather than on a total of live births plus foetal deaths. The formula for the rate recommended for international purposes thus becomes as follows:

$$\text{Annual crude foetal-death rate} = \frac{\text{Number of foetal deaths which occurred among the population of a given geographic area during a given year}}{\text{Number of live births which occurred among the population of the given geographic area during the same year}} \times 1{,}000$$

2. Late foetal-death ratio

If the argument is valid that deficiencies in registration and reporting of foetal deaths (as compared to live births) would make it advisable, for purposes of comparability, to compute foetal-death rates on a base consisting of live births alone rather than on the theoretically more accurate "exposed-to-risk" group, then for the same reason, it follows that the numerator would be more comparable from country to country if limited to late foetal deaths or "stillbirths". The use of total registered foetal deaths in the numerator will produce a rate which, for many years to come, will be subject to wider variation between countries than the more stable "late foetal-death" rate. It has been suggested, therefore, that until such time as registration of all foetal deaths improves considerably, an additional type of foetal-death index be computed. This is the ratio which would relate the number of late foetal deaths to the number of live births in the following formula:

$$\text{Annual late foetal-death ratio} = \frac{\text{Number of foetal deaths of 28 or more completed weeks of gestation which occurred among the population of a given geographic area during a given year}}{\text{Number of live births which occurred among the population of the given geographic area during the same year}} \times 1{,}000$$

Late foetal-death ratios computed according to the above formula would also provide continuity with the commonly accepted "stillbirth ratios".[14] It is not suggested, however, that the late foetal-death ratio replace the total foetal-death rate but only supplement it until registration is substantially improved.

In connexion with both foetal-death rates and ratios, attention should be drawn again to the prime source of international non-comparability, that is, to the differences in the definition of foetal deaths and live births. These national differences in concepts have been discussed in chapter IV.

It may be considered that foetal mortality, in so far as statistical measurement of the problem is concerned, is about in the same stage as "infant mortality" was in many countries a half century ago. As noted by Yerushalmy and Bierman,[15] in reference to infant mortality in the United States some 40-50 years ago, "the exact size of the problem [of infant mortality] was not known because of the grossly inadequate registration of births and deaths throughout the country and lack of uniformity in registration laws and practices among the states and among communities within the states". Present knowledge of foetal mortality suffers from the same defects and presumably will yield to the same solution, that is, standardization of definitions, nomenclature, classifications and tabulations, and improvement in registration completeness.

3. Perinatal mortality

Because there is reason to believe that some deaths during the first week of life are inadvertently or deliberately registered and counted as late foetal deaths, and because the problems underlying late foetal mortality are frequently related to those causing mortality during the first few weeks of life, some investigators have suggested combining data to obtain one rate which would measure the risk of dying during the period near parturition, also known as the "perinatal" period.

Although the underlying concept is accepted, there is no general agreement as to the range of the perinatal period. There seems to be a consensus that it should include "the period of prenatal existence after viability is reached, the duration of labour, and the early part of extra-uterine life".[16] There also appears to be general agreement that for defining the prenatal period, 28 completed weeks of gestation may be accepted as the lower limit of viability; thus, late foetal deaths or "stillbirths" would be one component of the rate. Disagreement arises in respect of the range of infant mortality which should be included, e.g., the first-week mortality,[17] first-month (neo-natal) mortality,[18] or some proportion which might be called the "endogenic" component.[19] Until there is agreement on a standard method, it will be necessary when using the rate to specify its components. Whatever the range of mortality in the numerator, the rate is usually computed per 1,000 live births.

F. Marriage rates

1. Crude marriage rate

The crude marriage rate expresses the additions, by the formal means of legal marriage, being made to the married segment of the total general population. The rate is not a probability index because it is computed on total population of all marital conditions and ages. Nor is it a true measure of "marriage" in the biologic or demographic sense, since it does not take account of the formation of consensual or common-law marriages. But, as a gross measure of the level of the relative frequency of marriages in the same area over a relatively short period of years and, for rough international comparisons, this rate has many uses. The

[14] Number of "stillbirths", as defined by country, per 1,000 live births.

[15] *Major Problems in Fetal Mortality*, by J. Yerushalmy and Jessie M. Bierman. Federal Security Agency. Public Health Service. National Office of Vital Statistics. Vital Statistics — Special Reports. Selected Studies, Vol. 33, No. 13, Washington, 22 May 1952. p. 217.

[16] *Study Group on Perinatal Mortality*. World Health Organization Regional Office for Europe. Document No. MH/EUR/74.54. Geneva, 1954. 84 p. Mimeo.

[17] *Ibid.*

[18] "The Measurement of Infant Mortality," *op. cit.* p. 31, 53-55.

[19] J. Bourgeois-Pichat. "De la mesure de la mortalité infantile". *Population*. No. 1, janvier-mars 1946, p. 53-68; and "Analyse de la mortalité infantile". *Revue de l'Institut International de Statistique*. Vol. 18, No. 1/2, 1950, p. 45-68.

formula for its computation is as follows:

$$\text{Annual crude marriage rate} = \frac{\text{Number of marriages which occurred among the population of a given geographic area during a given year}}{\text{Midyear total population of the given geographic area during the same year}} \times 1{,}000$$

2. Modified crude marriage rate

The crude marriage rate does not take account of variation between areas in "marriageable population", that is, the marital-status composition and the age distribution of the population. A different type of marriage rate which takes account of this factor relates the total number of marriages performed to the total population legally able to be married, i.e., the "marriageable" population. For most countries, the marriageable population consists of the sum of the populations over a stated age classified as single, consensually married, widowed, divorced, and of unknown marital status.[20] Such a rate provides a better measure of the level of nuptiality among different populations and also a better index to changes over time in the same area, but it has the disadvantage of requiring a population base usually available only at the census period. The formula for this crude rate modified to take account of the limited population base is as follows:

$$\text{Modified crude marriage rate} = \frac{\text{Number of marriages which occurred among the population of a given geographic area during a given year}}{\text{Midyear marriageable population above a stated age in the given geographic area during the same year}} \times 1{,}000$$

It should be noted that this rate could be made specific for age and sex by restricting both the numerator and the denominator to specified age-sex groups.

3. Rate specific for previous marital status

Similar to live-birth and death rates, marriage rates to be most useful for demographic analysis must take into consideration the structure of the population which they represent. An important consideration is that of taking account of the proportions which the individual marital-status groups of the marriageable population form of the total. A marriage rate to meet this requirement, i.e., specificity for marital status, would also need to take account of a minimum age, inasmuch as in most countries, the law specifies a "minimum age" below which a marriage may not take place. A formula for the rate, incorporating these considerations, would take the following form:

$$\text{Annual marriage rate specific for previous marital status} = \frac{\text{Number of marriages which occurred among a specific marital-status group of the population of a given geographic area during a given year}}{\text{Midyear single, widowed or divorced population above a stated age in the given geographic area during the same year}} \times 1{,}000$$

[20] For populations in which polygamous marriages of males is customary, it may be desirable to include also the married-male population.

Rates specific for previous marital status are useful in revealing sociological patterns of nuptiality. However, they have the disadvantage that population data by marital status are generally available for most countries only at the census period and, hence, such rates can usually be computed only once a decade.

4. Rates specific for age, sex, and marital status

Marriage rates specific for previous marital status will allow certain comparisons to be made from one country to another, but they do not take account of variations in the age and sex distribution of the populations being compared. In order to obviate the effects of differing age-sex compositions, age-sex specific rates must be computed. Combining these factors produces a marriage rate specific for age, sex, and marital status, the formula for which would be as follows:

$$\text{Annual marriage rate specific for age, sex, and marital status} = \frac{\text{Number of marriages which occurred among a specific age-sex-marital status group of the population of a given geographic area during a given year}}{\text{Midyear population of the specified age-sex-marital status group in the given geographic area during the same year}} \times 1{,}000$$

In addition, marriage rates specific for other characteristics such as "occupation", "religious affiliation", "ethnic group", and so forth, can be computed, using an adaptation of the above formula.

G. Divorce rates

1. Crude divorce rate

The crude divorce rate is a measure of the rate with which marriages are dissolved by legal process, that is, through means other than death. The method of computation to obtain a rate analogous to other crude rates relates total divorces to total population in the following form:

$$\text{Annual crude divorce rate} = \frac{\text{Number of divorces which occurred among the population of a given geographic area during a given year}}{\text{Midyear total population of the given geographic area during the same year}} \times 1{,}000$$

A rate computed by the above formula is useful in analysing short-time trends and, to a more limited extent, in making gross comparisons of rates among countries.

2. Modified crude divorce rate

The obvious defect of the crude rate described above is that the total population is not all subject to marriage dissolution, because the individuals in the population are not all in the married state. Hence, a refinement of this rate is often made by computing it on the exposed-to-risk population, namely on the number of legally married couples present in the population. The formula for this rate is as follows:

$$\text{Modified crude rate or divorce rate based on married couples} = \frac{\text{Number of divorces which occurred among the population of a given geographic area during a given year}^{21}}{\text{Midyear number of married couples among the population in the given geographic area during the same year}} \times 1{,}000$$

The formula outlined above has one rather outstanding shortcoming, and that is the difficulty of obtaining a good estimate of the denominator. Such estimates are usually obtainable only at the time of the census and even then, there are always variations between the number of males reported as "married" and the number of females so reported. Moreover, it will be found that, although this rate is theoretically a better one, it will not reflect variations between areas or changes in time much more accurately than the crude rate.

3. Divorce rate specific for age and sex

The divorce rate computed on married couples measures the risk of divorce among the population. For international comparison, however, rates which take account of the differences in the age of married persons in the various populations, are desirable. It is necessary, therefore, to compute divorce rates specific for age and other characteristics. The formula for the age-sex specific divorce rate which follows is similar to other age-sex specific rates.

$$\text{Annual divorce rate specific for age and sex} = \frac{\text{Number of divorces which occurred among a specified age-sex group of the population of a given geographic area during a given year}}{\text{Midyear married population of the specified age-sex group in the given geographic area during the same year}} \times 1{,}000$$

General use of this age-sex specific rate is handicapped by the fact that the required population base is usually available only near the census year.

4. Divorce rate specific for duration of marriage

Like the age-sex specific rate, this rate requires married population, but it must be classified also by duration of marriage. The formula for the rate is as follows:

$$\text{Annual divorce rate specific for duration of marriage} = \frac{\text{Number of divorces which occurred among a specific marriage-duration group of the population of a given geographic area during a given year}}{\text{Midyear married population of the specified marriage-duration group in the given geographic area during the same year.}} \times 1{,}000$$

Similar specific divorce rates may be computed for "occupation" groups, "literacy", and so forth.

[21] Because the rate can usually be computed only at the population-census period, and because there are wide fluctuations of an administrative character in the annual number of divorces, it is customary to define the numerator as an average of several years' experience around the census date.

H. Derived indices

1. Adjusted rates

The criticism of the crude birth, death, marriage, and divorce rates as indices for inter-area comparisons is that they fail to take account of differences in the age (or age-sex) structure of the populations in question and, thus, they fail to reveal the "real" mortality, fertility, or nuptiality forces. It has been suggested, therefore, that the crude rates be "adjusted" to allow for the known differences in the age composition of the populations involved. The single rate resulting from this adjustment would be a composite one which summarized the fertility, mortality, or nuptiality experience of the population under study and eliminated the variations which result from differences in age composition.

It should be noted, however, that many experts have contended that no attempt should be made to express natality or mortality experience in a single figure (other than the crude rate) and that analyses and comparisons should always be based on individual specific rates. It is maintained that the crude rates themselves serve well enough for such conclusions as are valid on the basis of a composite rate without introducing a hypothetical rate or index which purports to be a summary of the specific rates but which may itself have some elements of spurious validity.

Disregarding for the moment the merits of a composite rate as an analytical tool, and accepting the premise that it is often convenient to be able to summarize, it may be useful to examine the various possible procedures. Several methods have been proposed, and different names have been applied to the results. Some workers have called these hypothetical indices "adjusted" rates; others, "standardized" rates; still others, "corrected" rates. Perhaps the most appropriate term is "adjusted rate", used with a prefix to identify the basis of the adjustment as for example, "age-adjusted death rate", and so forth. This terminology will be used in the discussion below.

Although most of the discussion of adjustment methods is in terms of mortality, such methods are equally applicable for removing the effect of age differences from other crude rates. For example, it may be desirable for comparative purposes to compute an age-adjusted birth rate — one which would take account of the fact that the female age distribution in one country or area was not identical to that in another. Similarly, some observed differences between countries in the crude marriage rate might be due to varying age-sex distributions of the population rather than to other reasons. The effect of these factors could be eliminated by either the direct or indirect methods described below.

It should be emphasized, however, that by removing the effects of age-sex variations in population composition, one does not compute a *better* index of mortality, natality, or nuptiality, but rather one constructs a figure which can be used for certain comparisons over time or space. Adjustment for differences of age or any other characteristic is a technique which makes analysis easier by eliminating one source of variation in order that the others may thereby be revealed more clearly.

The two principal methods of age adjustment have become known as (1) the direct method and (2) the indirect method. These and the other generally known types — the "life-table death rate" and the "equivalent average death rate" — have been set forth comprehensively by Theodore D. Woolsey,[22] together with an extensive discussion of the objectives and criteria of mortality indices in general. A complete examination of all the methods will not be given in this *Handbook;* the discussion below will make only brief reference to those which are best known.

(a) *Direct method*

> "The direct method [according to Woolsey[23]] gives the death rate that would occur in some standard population if it had the mortality of the given community, or the death rate that would occur in the community if its population were distributed as that of the standard."

If the object is to summarize an entire series of age-specific rates, one may begin by recognizing that the crude rate itself is, in effect, a weighted average of rates specific for age, where the weighting factors are proportional to the populations at the various ages. But because the population distributions, and hence the weighting factors, vary from area to area, the crude rates do not summarize the mortality picture shown by the age-specific rates. The direct method of adjusting for age consists of weighting the specific rates, not by the population of the area to which they refer as is implied in the computation of the crude rate, but by the population distribution of another area, chosen as a standard. In the direct method, the rates specific for age for one geographic area are multiplied, age group by age group, by the corresponding populations of another area which, for this purpose, is considered as a "standard". The resulting "expected number" for each age group is summed, and the total is divided by the total standard population to obtain an age-adjusted "rate". Illustrative results of applying this method to mortality in a number of countries during 1940 will be found in *Summary of International Vital Statistics 1937-1944.*[24]

Another method of utilizing the adjusted totals obtained by the "direct method" described above is to divide the "expected number" by the "recorded number" of events to obtain a measure of the extent to which one exceeds or falls short of the other. Ratios so constructed give at a glance the percentage by which the specific forces of mortality or natality operating in an area would increase or decrease the number occurring in a population which in age distribution was like that of the standard.

The obvious defect of the *direct method* as a means of adjusting for the age differences of several populations is that it entails the choice of a "standard" population. The choice of this "standard" will naturally affect the magnitude of the resulting adjusted rates and may change their relative positions with respect to each other. However, in eliminating bias on a national basis, it is customary to use the total population of the country as "standard" for "adjusting" the rates of the regions within the country. There is no generally accepted standard population for international comparisons.

(b) *Indirect method*

> "The indirect method adjusts the crude death rate of the community by applying to it a factor measuring the relative 'mortality-proneness' of the population of the community."[25]

In this method, the "standard" is a set of specific rates, rather than a population distributed by age. To compute an age-adjusted rate by the indirect method, one requires the population of the area distributed by age. These given populations are multiplied, age by age, by the "standard" age-specific rates to obtain the "expected number of events in the standard area" if it were subject to the given age distribution. The sum of these "expected events" divided by the population in the area under consideration gives an "expected rate" or "index rate" in the "standard area" — one which is "dependent solely on the sex-age constitution of the population and as a rule may be treated with sufficient accuracy as remaining constant over a period of years adjacent to the experience period".[26] The "index rate" is customarily divided into the crude rate of the "standard" area, and the resulting ratio is known as an "adjustment factor", which can be used to adjust the crude rate of the area under consideration.

(c) *Life-table death rate*

The life-table death rate, since it is dependent solely on age-specific death rates, has often been recommended as the correct measure of current mortality.

From a practical viewpoint, the objection to the use of the life-table death rate is the laborious nature of the computations involved. For a thorough discussion of its merits and limitations, see *Vital Statistics Rates in the United States, 1900-1940,*[27] *Length of Life,*[28] and the text from the *Demographic Yearbook 1954* which is reproduced on p. 198.

(d) *Equivalent average death rate*

"The method of equivalent average death rates is basically an average of the specific rates without weighting, except such as is used to compensate for differences in the width of the age groups."[29] In practice, the rates specific for five-year age groups, for example, are summed through some convenient age group, usually 64, and this sum is divided by the number of age groups to obtain a simple average. It is thus an approximation to the sum of all single-year

[22] *Vital Statistics Rates in the United States, 1900-1940, op. cit.* Chapter IV, p. 60-91.

[23] *Ibid.* p. 74.

[24] *Summary of International Vital Statistics 1937-1944.* Federal Security Agency. U. S. Public Health Service. National Office of Vital Statistics. Gov. Print. Off., Washington, 1947. p. 26-28.

[25] *Vital Statistics Rates in the United States, 1900-1940, op. cit.* p. 74.

[26] *The Registrar-General's Decennial Supplement, England and Wales, 1921.* Part III, Estimates of Population, Statistics of Marriages, Births, and Deaths, 1911-1920. H.M. Stat. Off., London, 1933. p. xxxv.

[27] *Op. cit.* p. 75-78.

[28] *Length of Life; A Study of the Life Table* by Louis I. Dublin *and others.* Rev. ed., Ronald Press, New York, 1949.

[29] *Vital Statistics Rates in the United States, 1900-1940, op. cit.* p. 82.

age-specific rates. This method was proposed by Yule[30] for the study of occupational mortality. It has been used by the Registrar-General of England and Wales to compare mortality in broad age groups between Scotland, Canada, South Africa, and eight European countries.[31]

(e) *Gross reproduction rate*

Since this rate summarizes the age-specific fertility rates without weighting and, unlike the crude birth rate, is not affected by the age distribution of the population, it may be considered as one of the methods of computing a natality index adjusted for age differences. A more detailed discussion of the index and its computation will be found below.

2. RATES OF POPULATION GROWTH

(a) *Natural increase rate*

The crude birth rate reveals the proportion by which the population is increased through the addition of new members. The crude death rate measures the "toll" on this same population. Rates of natural increase or decrease, that is, rates computed on the balance of births and deaths, give some measure of the over-all gain or loss in a population through the addition of births and the subtraction of deaths.

The annual rate of natural increase can be computed simply by subtracting the crude death rate from the crude birth rate. The formula for such a rate might be written as follows:

$$\text{Annual natural increase rate} = \frac{\text{Number of births which occurred among a population of a given geographic area during a given year minus the corresponding number of deaths}}{\text{Midyear population of the given geographic area during the same year}} \times 1{,}000$$

(b) *Gross and net reproduction rates*

Formulae for gross and net reproduction rates may be found in various textbooks and in the technical literature. An excellent review is contained in *Length of Life,*[32] while rates for various countries together with a descriptive discussion will be found in *Summary of International Vital Statistics 1937-1944*[33] and in the United Nations *Demographic Yearbooks*. For convenience, the descriptive section on the subject from the *Demographic Yearbook 1954* is reproduced below:

"The gross reproduction rate is the sum of female age-specific fertility rates. The rates are obtained by dividing the female live births in a year to women of given age by the female population of that age. They are then added together for all ages. The result is a rate 'per woman' . . .

"The gross reproduction rate affords a method of summarizing, for comparative purposes, the age-specific fertility rates of women as recorded in different times and places. Unlike the crude birth rate the gross reproduction rate is not affected by the age distribution of the population.

"In addition, the gross reproduction rate has often been interpreted as a measure of the average number of daughters produced by women during their lifetime. If a group of women born at the same time should experience at various ages the fertility rates on which a given gross reproduction rate is based, those who were still alive at the end of the reproductive age period would have borne on the average approximately the number of daughters indicated by the gross reproduction rate. However, this would be precisely true only if the women who died or emigrated before they reached the upper limit of the child-bearing period were not specially selected with regard to fertility.

"According to another interpretation, the gross reproduction rate indicates the average number of daughters who would be born to a group of girls beginning life together, in a population where none died before the upper limit of child-bearing age (and where there was no migration) and where the given set of fertility rates was in operation. The gross reproduction rate thus shows the upper limit of the rate of population growth which would eventually occur if the fertility rates at a given time were maintained and the mortality of females under, say, fifty, were reduced to zero. For example, in a population which permanently maintained fertility rates yielding a gross reproduction rate of 0.8, the number of births would in the end be reduced by 20 per cent per 'generation' even if no women died before living through the child-bearing period. A 'generation' in the sense relevant here is roughly equal to the mean age of mothers at the birth of their daughters, in a stationary population subject to the fertility rates in question. It is usually about thirty years.

"Net reproduction rates are obtained by multiplying the specific fertility rates of each [age] group by the proportion of survivors to that age in a life table and adding up the products. The net reproduction rate may be interpreted, in analogy with the gross rate, as the average number of daughters that would be produced by women throughout their lifetime if they were exposed at each age to the fertility and mortality rates on which the calculation is based. It also indicates the rate at which the number of births would eventually grow per 'generation' if the fertility and mortality rates on which the calculation is based should remain in operation indefinitely.

"In using gross and net reproduction rates as means of analyzing the implications of observed fertility and mortality rates for future population development, it should be borne in mind that the age-specific fertility and mortality rates recorded in a given country at a given time do not actually represent the experience of any real generation of women, and that they may be influenced by factors which are, by their nature, necessarily temporary. Moreover, they do not take account of the fertility and mortality of the male population. Other indices which may come into wider use in the future as a result of recent discussions of the limitations of these rates — for example, measures of reproduction of the male population — have so far been computed for

[30] "On Some Points Relating to Vital Statistics, More Especially Statistics of Occupational Mortality" by G. U. Yule. *Journal of the Royal Statistical Society,* Vol. 97, London, 1934. p. 1-84.

[31] *The Registrar-General's Statistical Review of England and Wales for the year 1934.* New Annual Series, No. 14, Text. H.M. Stat. Off., London, 1936.

[32] *Op. cit.* p. 236-252.

[33] *Op. cit.* p. 22-23, 128-131.

only very few areas and time periods. Increasing attention is being paid to the analysis of fertility trends on the basis of statistics of births classified by parity and by duration of marriage . . .

"The accuracy of gross reproduction rates obviously depends on the accuracy with which age-specific fertility rates can be computed. The principal sources of error are: (1) under-registration of births; (2) mis-statements or inadequate statements of the age of mother at registration; (3) errors in enumerations or estimates of the female population by age groups . . .

"Reproduction rates are normally calculated from fertility rates relating to five-year age groups and to all births, both male and female. This differs somewhat from the procedure implied in the definition of reproduction rates as given above. However, the use of rates relating to single years of age and based only on female births leads to results which differ insignificantly from those given by the usual procedure."

3. Life tables

It is not within the scope of this *Handbook* to present the methods of constructing life tables. Various types of tables may be constructed to meet special needs, but basically they all require certain fundamental data — number of deaths in a given period classified by age and sex, and a midpoint estimate of the population of each age and sex during the same period. It may be noted that in deriving values for ages under one year, it is frequently necessary to use also statistics of births for the same, and perhaps prior, periods in order to estimate the number of infants at risk of dying during the first year of life. The methods of using these components for the computation of life tables for the designated population, area, and period have been set forth in various technical sources.[34]

The most important life-table values from the viewpoint of vital statistics are the "expectation of life" or more correctly the "mean after lifetime" and the life-table death rate. The life-table death rate represents the probability of dying during a given age interval, usually one year. It is the basic function of the life table and is commonly indicated by the symbol q_x, the subscript referring to the age and the values for specific ages being written q_0 for "under 1", q_1 for age 1, etc.

The mean after lifetime, or the average number of years of life remaining at birth and for persons reaching specified ages, is based on the mortality rates of the life table and is to be interpreted strictly in terms of the underlying assumption that surviving cohorts are subjected to the age-specific mortality rates of the period to which the life table refers. For a number of countries, these values, together with the 1_x or "survivors at the beginning of each age interval", have been published in various issues of the United Nations *Demographic Yearbooks*. Technical notes on life tables are included there also, and the following discussion of the uses and meaning of each of these life-table values is reprinted from that source:[35]

"Though first developed for actuarial purposes, the life table has many applications in the demographic field. Among these are: (1) the preparation of population projections by age and sex; (2) analysis of effects of mortality on the age and sex composition of a population; (3) comparisons of summarizing measures of mortality, as the life table death rate (the reciprocal of the expectation of life at birth), expectation of life at various ages, etc.; (4) computation of net reproduction rates; and (5) the appraisal of the accuracy of census enumerations and vital registration data. In addition, life-table techniques have been applied to the analysis of other types of demographic data, for example, in the computation of probabilities of marriage, specific for age and sex, on the basis of census data classified by marital status . . .

"The accuracy of life tables depends mainly upon the accuracy and completeness of the registration of deaths and of the enumeration of the population at the census. Deficiencies in death registration are likely to be greater than in census enumeration. Where this happens, death rates are understated and the 1_x and e_x values are exaggerated. The mortality rates computed from population and death statistics at the very young ages are particularly likely to be understated, and such an error affects the 1_x values throughout the table. As indicated earlier, infant mortality rates obtained by relating the number of infant deaths to the number of births in countries where registration is deficient may be either too low or too high, and the error in either direction may have an important effect on the 1_x values for every age. The expectation of life at birth (e_0) will also be too high or too low.

"The accuracy and the international comparability of life-table values are particularly suspect at the highest ages. Those values depend, as has been said, on imperfect data and frequently on somewhat arbitrary procedures. Certain remarkable features— for example, the fact that the expectation of life at ages over sixty is often distinctly higher in countries where mortality in general is heavy than in countries with low death rates — may, thus, merely reflect imperfections of the tables.

"Differences in the methods used for constructing life tables (adjustment of data, graduation, etc.) may affect the reliability of the results and impair their international comparability. The effect of such differences is, however, probably much smaller than that of deficiencies in censuses and in death registration . . .

"Details of procedure in life table construction vary somewhat, depending in large measure upon the availability and form of basic data. The values of q_x are generally so derived as to correspond to the

[34] Reference may be made to: *Life Contingencies* by E. F. Spurgeon, 3rd ed., Cambridge Univ. Press, London, 1938; *Actuarial Studies*, Nos. 1, 2, 3, 4, and 5, Actuarial Society of America, New York; *United States Life Tables, 1890, 1901, 1910, and 1901-1910* by J. W. Glover, Bureau of the Census, Washington, 1921; *United States Abridged Life Tables, 1919-1920* by E. Foudray, Bureau of the Census, Washington, 1923; and *United States Life Tables and Actuarial Tables, 1939-1941* by T. N. E. Greville, Bureau of the Census, Washington, 1946. These references have been taken from *Length of Life* (*op. cit.* p. 303), which also gives extensive data and a general discussion of the interpretation and application of life tables.

[35] *Demographic Yearbook*. United Nations. Statistical Office. 6th issue, 1954. p. 38-39. (Sales No. 1954.XIII.5)

death rates of persons of that age in a particular period of time. The basic data ordinarily consist of (*a*) deaths in a given period classified by age and sex and (*b*) the mean population of each age and sex during that period. The most usual procedure is to utilize statistics of deaths in a three-year or five-year period centred at the census date so that the census figures can be taken as the mean population. Sometimes the period covered is that between two censuses, and the population figures utilized are averages of the results of the two censuses. A correction for the effect of migration is occasionally made. In a few rare cases (for example, in India), approximate life tables have been computed without the use of data on deaths by deriving q_x values from the comparison of the population in each age group as enumerated at one census with the survivors at the next census. It is common to make adjustments in order to correct for mis-statements of age in the census and death-registration data and in order to obtain successive values of q_x which vary smoothly from one age to the next.

"Special problems arise in deriving q_x values for the very young ages and for the end of life. For the young ages, q_x values are frequently obtained by using the statistics of births occurring in the last few years and estimating from them the number of persons at risk of dying in the period to which the life table relates. At the older ages, data are frequently so scanty or unreliable that they have to be subjected to considerable manipulation if a reasonable series of q_x values is to be derived from them. In many cases, the life-table q_x values at the high ages do not depend in any way on the registered deaths at those ages, but have been estimated on the basis of q_x figures for younger ages."

CHAPTER XIV

EVALUATION OF THE VITAL STATISTICS SYSTEM

One essential aspect of a good system of vital statistics is the provision for critical evaluation. Recognition of the need for evaluation of the efficiency of all procedures, from the creation of the legal records to the compilation of the statistical publications themselves, is essential for the well-being of the system. Provision of appropriate methods for evaluating the various facets of the system, and constant vigilance to see that approved methods are applied and that remedial action is taken if required, are the primary functions of the offices responsible for vital statistics.

A. International recommendations

To emphasize its importance, the United Nations has included a Principle on this point in the recommendations for improvement of vital statistics.[1] It reads as follows:

"106. *Critical evaluation of the vital statistics system*

"(*a*) As a supplement to co-ordination, responsibility for the establishment and execution of methods for critical evaluation of the vital statistics system should be vested in a designated authority.

"(*b*) The elements of the evaluation programmes will vary in detail according to the degree of development of the system, but should include at some stage intensive studies of the degree of completeness of registration and of statistical reporting of events, with a view to evaluating the quantitative accuracy of vital statistics; analysis of the completeness and accuracy with which items of information relating to an event are recorded; determination of the success with which the tabulation programme meets the needs of consumers in terms of timeliness, adequacy and quality of statistics, and the general efficiency with which the system operates."

This Principle envisions that studies of the degree of completeness of registration and statistical reporting are to be made with a view to evaluating, and providing for improvement in, (1) the *quantitative accuracy* of vital statistics, i.e., the accuracy of the totals and their distribution by characteristics; (2) the *qualitative accuracy* of the *items* reported or, in other words, the quality of the answers to the questions on the statistical reports; and (3) the degree of success achieved by the tabulation programme, i.e., is it current and timely? are the data available in the classes and categories needed by the consumer? and finally, is the service, in general, efficient? Of these questions, only the first two can be treated in this *Handbook*. The third is subjective in the sense that it is dependent on the criteria of timeliness, reliability, and efficiency current in each country.

[1] *Principles for a Vital Statistics System; Recommendations for the Improvement and Standardization of Vital Statistics.* United Nations. Statistical Office. Document ST/STAT/SER.M/19, 26 August 1953. p. 5. (Sales No. 1953.XVII.8)

The paragraphs which follow deal with the methods of measuring the degree of completeness with which births, deaths, and stillbirths are registered and reported for statistical purposes, and the techniques of investigating quality. By its very nature, completeness of registration of legal marriages and divorces need not be considered in the following discussion. In most countries, marriages and divorces are automatically registered as they occur; the discussion of methods, therefore, will be limited primarily to those that apply to the three events mentioned above.

B. Testing completeness of registration

The implications of registration procedures on the completeness with which registration may be made have been stressed repeatedly in this *Handbook*. The concept of compulsory registration in the basic law and the measures to induce compliance; the pattern of organization set up to register vital events; the number, location, identity and qualifications of the registrar; the identity of the responsible informant; the time allowed for registering; the cost of registering — all of these, plus the intangibles which originate in a tradition of acceptance and respect for registration as a worthwhile and important obligation, have a decided effect on the completeness with which vital events are registered.

Incompleteness of birth and death registration is the most important source of errors in natality and childhood mortality statistics. Measuring the degree by which registration is deficient is a difficult problem, but one which is of great importance to the improvement of vital statistics, as well as to the analyst in his use of the data. No test or measure can be considered definitive, of course, because of the potential "incompleteness" of any other source of information used as a check. But certain approaches to the problem have been found to have merit, and these will be set forth below. The two types of testing procedures which will be discussed are evaluation of registration (1) in terms of aggregate numbers registered — a relatively rough method — and (2) by tracing or matching of a group of individual records[2] — a more refined approach. Consideration of the applicability of these two general methods should be based on the principle that refined measurement techniques become less and less important where underregistration is obviously great. Precision is necessary only in those areas where registration is relatively complete but where there is appreciable variation on a geographic or ethnic basis.

[2] Further discussion of these methods may be found in *Fertility of the Population of Canada* by W. R. Tracey. Dominion Bureau of Statistics. Census Monograph No. 3. Ottawa, 1941. Chapter I; *Handbook of Statistical Methods for Demographers* by A. J. Jaffe. Preliminary Edition. Bureau of the Census. Gov. Print. Off., Washington, 1951. Chapter 5; "The Completeness of Birth Registration in the United States" by P. K. Whelpton. *Journal of the American Statistical Association*. Vol. XXIX, No. 186, June 1934.

1. By checking on total number of events registered

(a) *Trends*

Within broad limits, the correctness of the total of events registered in any specified time period can be verified. Each local registrar can determine in some simple and systematic manner the number of records filed for any month, quarter, or year. Unless the nature of the population living in the registration unit changes rapidly either in number or characteristics (a phenomenon only to be expected as a result of mass migration or a fatal epidemic), the total number of live births and deaths occurring in that population will not vary greatly from month to month, except in so far as they are affected by factors influencing delayed registration. Therefore, the local registrar can verify roughly the number of registrations received in any one time period by comparing it with the number registered in a previous corresponding period. He can continue to do this routinely, taking such steps as are necessary to correct or remedy the deficiencies he uncovers in the process. The evaluation made by the local registrar cannot be definitive, but it is important that he be aware of the need for scrutinizing the registers in this way. At the provincial and national levels, this technique may be applied with greater accuracy, with the aim of querying local registrars on discrepancies which appear significant.

(b) *Proportion delayed*

At the provincial and national levels, the registrar has another means of evaluating quantitative completeness of registration. He receives constantly not only current but delayed registrations; the proportion that the delayed registrations form of the total is a useful index to the incompleteness of registration during previous time periods. Moreover, an examination of the delays by time elapsed between occurrence and registration would allow comparisons to be made over time with a view to seeing whether improvement or retrogression was taking place. This process too can be a continuous part of the supervisory registrar's function or even of the statistical service.

(c) *Comparison with census aggregates*

A third procedure which may be employed to check accuracy of the number of live births registered is to compare the aggregate results of a census of population with registered births. One of the simplest methods of utilizing the census for this purpose involves relating the number of children under one year enumerated in the population census to the number of live births registered in the 12 months preceding the census, making allowance for the number of deaths of these children during those months.[3] Unless there have been extensive migration movements, theoretically the number of children born in, and surviving, the 12 months preceding the census should equal the number of children under 1 year enumerated at the census date. The relationship can be expressed in the form of an equation as follows:

$B = p_o + fd_o$, where

B = estimate of number of live births which occurred during the 12 months preceding the census

p_o = population enumerated under age 1

f = proportion of annual deaths under 1 year of age which were deaths of infants born and dying in the same calendar year[4]

d_o = number of infants under 1 year of age who died during the 12 months preceding the census

fd_o = number of infants under 1 year of age who were born and died in the year preceding the date of the census (those who would have been under 1 year of age at date of the census)

In order to demonstrate the application of this formula for international comparisons, the value of 0.7 has been assigned to "f" arbitrarily and the formula applied to the data for all the countries for which the required information appeared in the 1948 *Demographic Yearbook* of the United Nations. Thus, the number of live births was estimated for the countries which had a census between 1940 and 1948, and for which the *Demographic Yearbook* supplied figures of birth registrations and death registrations. An example will help to clarify the procedure. Finland had a census on 31 December 1940. The population enumerated under 1 year of age was 62,860; the number of births registered in 1940 was 65,849, and the number of deaths under 1 year was 5,813. By application of the formula mentioned above, the estimated number of live births would be:

$$B = p_o + fd_o$$
$$B = 62{,}860 + (0.7 \times 5{,}813) = 66{,}929$$

It can be seen that for Finland the estimated number of live births (66,929) was practically the same as the number of live births registered (65,849). This is an indication that birth and death registration, as well as census enumeration of infants at least, is virtually complete in Finland. Application of the same formula to data for other countries has shown that it provides a means of detecting extreme cases of underregistration of births. According to the formula, birth registration is 70 per cent complete in Peru; 84.7 in Colombia; 96.2 in Venezuela; 79.2 in Korea; 87.8 in the Philippines; 91.8 in Thailand; 92.3 in Guatemala; and 78.9 in Nicaragua.

It is a well-known fact, however, that enumeration of young children in the census is often markedly deficient and, since the adequacy of the test depends on assuming that the infant enumeration is correct, the

[3] Apparently this method was first used to estimate the number of live births for the United States of America in connexion with the census of 1880. See "An Attempt at a Statistical Determination of the Birth Rate in the United States" by Anders Nicolai Kiaer. *Publications of the American Statistical Association.* Vol. 14, No. 127, September 1919. p. 440-457. It has been used also by W. Lexis in reference to data for Belgium in his classical work "Abhandlungen zur Theorie der Bevölkerungs und Moralstatistik" (Jena, Fischer 1903); by Giorgio Mortora (see p. 7); and by S. P. Jain for Indian data ("Birth Rates Derived from Infants Enumerated." *Estimation of Birth and Death Rates in India During 1941-50—1951 Census.* Census of India, Paper No. 6, 1954. p. 47-56).

[4] The ratio of children dying in the same calendar year as that in which they were born to the total number of infant deaths in the same calendar year has been called the "separation factor" and is widely used in the construction of life tables and in other studies. It is fairly constant in value for any one country, ranging from 0.65 to 0.9; its minor variations do not affect to any appreciable extent the validity of the formula.

test is obviously subject to large errors. For these reasons, the number of births estimated will be smaller than the true number and, therefore, the percentage of completeness will appear larger than it actually is. An extreme example of the operation of this bias is shown in the data for Mexico. In 1939-1940, the number of births estimated from the Mexican census returns of 6 March 1940 was 611,000, while the number of births actually registered in the 12-month period immediately preceding the census was approximately 870,000. Even with an allowance for delayed registrations of births, the difference shows that the census enumeration of children under 1 and possibly the registration of deaths under 1 must have been very incomplete. The possibility that the quality of a national census may vary geographically is another handicap in using the gross relationship of births and deaths registered and census returns as a measure of completeness.

Another method based on census results which may be employed to estimate live births for comparison with registered births has been used in Chile. In the Chilean[5] application of this method, population enumerated at each year of age from 4 to 14 years is used to estimate the number of births which must have occurred in each calendar year 4 to 14 years prior to the census year. If the census was taken on 31 December of a given year, the population of age 4 are the survivors of the children born alive in the fourth calendar year before the census year. The number of births in the fourth calendar year before the date of the census can then be estimated by adding to the number of children of age 4 at the time of the census the number of deaths which occurred between birth and the date of the census in the cohort of children born in the fourth calendar year before the census year. The deaths in the cohort are obtained by the proper allocation of deaths at each age by year of birth. Separation factors (see p. 201) are used for this purpose. The process for other ages would be similar. The relationship between the number of births in a calendar year, the number of survivors on 31 December of a future year, and the number of deaths from the cohort can be expressed in an equation as follows:

$$B^{k-x} = P_x + f_x d_x^{k-o} + (1 - f_{x-1}) d_{x-1}^{k-o} + f_{x-1} d_{x-1}^{k-1} + (1 - f_{x-2}) d_{x-2}^{k-1} + \ldots + f_{x-2} d_{x-2}^{k-2} + f_{x-x} d_{x-x}^{k-x}$$

For this equation, the exponents (k-x, k-o, etc.) indicate the year of occurrence; the subscript indicates age in years at last birthday.

- B = number of births
- P_x = population of x completed years of age at the time of the census (31 December)
- f_x = separation factor for age x (proportion of deaths of age x which are born in the latest of the two possible calendar years)
- d_x = deaths of x completed years of age
- k = census year (e.g., 1950)

In addition to providing estimates for several calendar years, this method has the advantage of not using the population figures for the first 3 years of age which are often heavily understated in most countries. Like the two census methods mentioned above, the degree of success achieved with this procedure depends on the accuracy of age reporting, the completeness of the enumeration, the completeness of death reporting, and so forth.

Still another method of measuring the completeness of birth registration is based on the comparison of estimated live births, obtained from the age distribution of census returns, and life-table survival rates.[6] This method, known as the "Reverse Survival Method," is easier to apply than the one described before. The probability of survival from birth to the centre of a given age interval is obtained from a suitable life table. Then, the number of children at a given age obtained from a census is divided by the probability of survival from birth to the centre of the age interval in order to obtain the estimated number of births for the corresponding calendar year previous to the census. This relationship can be expressed in an equation as follows:

$$B^{k-x} = \frac{1}{p_x} P_x$$

p_x = Probability of survival from birth to the centre of the age interval $x - (x + 1)$, x and $(x + 1)$ being exact ages (birthdays). This probability could be obtained from a life table whose radix is 100,000 by using the following relationship:

$p_x = \frac{1_x}{100{,}000}$, where 1_x is the stationary population in the interval x to $(x + 1)$.

2. By matching of records

The second type of checking procedure which the local registrar can carry out is a more specific one. It involves the matching of records which originate in one source (in this case, the civil register) to those from another independent source, a procedure which should be a continuous part of the registrar's duties. The outstanding difference between this and the approximating measures described above is that, in addition to providing the data required to compute an estimate of the gross level of underregistration, this method also provides a means of improving registration by identifying unregistered cases of live birth or death.

The applicability of registration tests of this type was recognized in the United States as early as 1908, when the American Public Health Association set forth

[5] "División del Censo de 1940 y porcentaje de nacidos que no se inscribieron en el registro civil" by Octavio Cabello González. *Revista chilena de higiene y medicina preventiva.* Vol. 8, Nos. 1-2, Santiago, marzo-junio 1946. p. 3-14. Also "Tablas de vida para Chile: 1920, 1930, 1940" (II Parte) by Octavio Cabello, Jerjes Vildósola, and Marta Latorre. *Revista chilena de higiene y medicina preventiva.* Vol. 9, No. 2, Santiago, junio 1947. p. 113-130. A variation of the method has been used to estimate underregistration in Jamaica. See "A Note on Mortality in Jamaica" by G. W. Roberts. *Population Studies.* Vol. IV, No. 1, London, June 1950. p. 65-67.

[6] This appears to be the method used by Dr. Farr in evaluating underregistration of births in England and Wales during 1837-1880 (1871 Census of England and Wales, Vol. IV). It has also been used among others by Mortara ("Conjeturas sôbre os níveis da natalidade e da mortalidade no Brasil no período 1870-1920" by Giorgio Mortara. *Revista Brasileira de Estatística.* Ano 1, No. 2, abril-junho de 1940. p. 229-242.), by Roberts ("Some Observations on the Population of British Guiana" by G. W. Roberts. *Population Studies.* Vol. 2, No. 2, London, September 1948. p. 197; and "A Note on Mortality in Jamaica", *op. cit.*), and by Jain ("Computed Birth and Death Rates in India during 1941-1950". *Estimation of Birth and Death Rates in India During 1941-50—1951 Census, op. cit.* p. 39-45.).

"Methods of Testing Accuracy of Registration of Births and Deaths". These methods which take the form of "Rules of Statistical Practice",[7] are as follows:

"RULE NO. 43 (43, 1908)—The accuracy (completeness with respect to total number) of the registration of births in a state or city may be satisfactorily determined by the proportion found actually registered out of a sufficiently large number (10 per cent of the total?) derived from any independent source, e.g., newspaper reports or lists of infants registered as births, and whose certificates of death enable the place and date of birth to be fixed, provided they are properly distributed throughout the state."

"RULE NO. 40 (40, 1908)—The accuracy (completeness with respect to total number) of the registration of deaths in a state or city may be satisfactorily determined by the proportion found actually registered out of a sufficiently large number (10 per cent of the total?) derived from any independent source, e.g., newspaper reports, and properly distributed through the state."

"RULE NO. 41 (41, 1908)—Local registrars should regularly note newspaper reports of deaths, in order to detect omissions and secure complete registration."

"RULE NO. 42 (42, 1908)—Registrars should periodically examine the records of interments in cemeteries used by their district and check up any interments made without proper registration and permit, in order to ascertain the number of unregistered deaths."

The above "Rules" raise immediately the question of the types of independent sources which may be used most effectively for such testing of completeness. The "newspaper reports of birth" mentioned above may well include only births in cities or large towns, those from well-to-do families, or those which receive medical care in hospitals. Cemetery lists of deaths would not include all deaths. Those births or deaths less likely to be registered, i.e., those occurring in isolated parts of the country, would also be the group least likely to be represented on such supplementary lists. It will be manifestly impossible to find a list of births or deaths which is complete and unbiased in its content. If such lists existed, they would be the official registers themselves. Therefore, it may be said that for comparative purposes any relatively unbiased list of events can be employed, keeping in mind at all times the possibility of selection in the list, and making allowances for this potential bias in evaluating the underregistration values derived from the comparison. It remains for the registrar to discover and exploit every source of this type, not only to gain some idea of the extent of underregistration, but to improve registration by locating unregistered births and deaths.

(a) *Civil registration records*

One of the first independent sources of information of cases of birth which suggests itself—and one available without additional arrangements—is the register of deaths. In some vital-records offices, a system of cross-checking between the death register and the live-birth register is routinely done for infant deaths. Should careful search fail to uncover a matching birth registration, steps are taken to register the birth.

This method is especially effective in connexion with deaths of very young infants which may be registered either as "stillbirths" or as "deaths" but, because of their short life, often fail to get registered as live births. It is, of course, much more difficult to do for deaths of older persons, because of the mobility of the population and the likelihood that a person will die in a place other than that where he was born. If there is a central depository of records and a central index of births and deaths, such cross-checking could be carried out routinely. However, its primary applicability is as a method of improving the completeness of current birth registration.

(b) *Notifications*

The most direct and comprehensive approach to obtaining an unbiased secondary source of information on vital events would be to arrange for "notification" of the event in addition to the formal registration. This would involve setting up a reporting procedure by which an informed person other than the legally responsible registrant becomes responsible for seeing that a report is made to the registrar. This system of notification is in effect in many countries (see table 7). In Canada and Japan, for example, the attendant at the birth, i.e., the physician, midwife, or hospital administrator, is responsible for reporting it to the registrar, even though the legal informant is the parent; in Ceylon, the headman of a village and the supervisor of estates have responsibility for declaring every birth or death which occurred in their areas.

Hospital or medical-care reports are probably the only possible supplemental reports which could be of assistance in testing completeness of foetal-death registration. A very good example of the applicability of such independent reports for this purpose may be found in the experience of New York City. It is known that in New York City, as in other parts of the world, registration of foetal deaths is very incomplete, especially at early gestational ages. No simple method of testing the degree of completeness was found until the Emergency Maternity and Infant Care (EMIC) Program came into being during the Second World War. This was a "federally supported program through which maternity care was provided free of cost to the wives of men in the four lowest pay grades in the armed forces".[8] The report from which this information was taken goes on to say:

"Under the regulations of that program, a physician or hospital or both were required to file a brief summary of the medical course of the patient prior to payment by EMIC. When these EMIC summaries were tabulated, it was found that there were 2,045 pregnancies in 1943, 1944 and 1945 which terminated in a fetal death. A search was then made to

[7] "Rules of Statistical Practice" adopted by the American Public Health Association 1908, 1909, and 1910. *Mortality Statistics: 1909*. Bureau of the Census. Washington, Gov. Print. Office, 1910 (Bulletin No. 108).

[8] "The Inadequacy of Routine Reporting of Fetal Deaths, as Evidenced by a Comparison of Such Reporting with Maternity Cases Paid for under the Emergency Maternity and Infant Care (EMIC) Program" by Leona Baumgartner and others. *American Journal of Public Health*. Vol. 39, No. 12, Albany, N. Y., December 1949. p. 1550.

see if a fetal death certificate was filed with the New York City Department of Health for each of the 2,045 fetal deaths. It was found that a certificate was filed for 1,147 or 56 per cent; no certificate was filed for 898 or 44 per cent. It was thus evident that the reporting of fetal deaths in New York City did not give a complete picture of total pregnancy wastage, since approximately 50 per cent were unreported."

Similar use could be made of the records from any medical-care programme which had broad and inclusive coverage of some segment of the population. Records of vaccinations and immunizations carried out by health authorities are also useful in this connexion. Notifications of baptisms performed in churches, cemetery records, and sales lists of caskets or special types of cloth used in burials can also be used for checking the registers.

One of the most effective lists is the record of school enrollment made annually for children entering the school system for the first time. In Canada, at the beginning of each school year, every teacher in charge of a school or individual class is required to prepare and mail to the Provincial Director a form entitled "Teachers Return Under the Vital Statistics Act". This is a list of the names of all children under the teacher's care who are attending school for the first time. The names on these lists are checked to the registers of birth, and steps are taken to register any for which a record is not located.

Efforts on the part of the registrar to secure the registration of all births taking place in an area have led to the adoption in many parts of the world of the notification system mentioned above. Estimates of incompleteness of registration can be derived from the results of this process, but the main function is to improve or maintain the completeness of registration. It is obvious that such estimates of incompleteness do not assess precisely the real problem, because they more than likely refer to small, non-contiguous areas in which certain types of "lists" may be available, and because they depend for their effectiveness on the initiative and industry of individual registrars. Moreover, the lists of notifications can never be said to represent "complete" coverage.

(c) *Lists developed by survey method*

Mail surveys. To develop a more objective test of "completeness", efforts have been made from time to time to create a more inclusive list of the names of live-born infants who, according to law, should be registered in an area, and to check these against registered events. Probably the first efforts of this type were made in the United States when the birth-registration area was being set up. One prerequisite for admission to the death-registration area, and later to that for births, was proof that registration was at least 90 per cent complete. Proof was obtained by means of tests. At first the test was based on the matching of names taken from newspaper lists, school censuses, etc., to the registers in the manner described above. In the early 1920's, a more systematic approach was made, namely, a post-card survey.

Under the new procedure, a post card was sent by mail to every family in a selected area, asking whether a child had been born into that household during a specified period of time. If a birth had occurred, the card was to be filled out and returned with the name of the child, the date of birth, and certain other identifying information. On receipt of such a communication, the authorities arranged for the search of the official records to determine whether or not the birth noted on the returned post card had been registered. The measure of completeness derived from this procedure was the percentage of post card-reported births found to be legally registered.

Tests such as this were carried on periodically, the last in 1934-1935. It was the policy of the United States Census Bureau, which had charge of vital statistics, to drop from the Registration Area any state which, as a result of these tests, showed a percentage of completeness less than 90. However, after the 1934-1935 test, in which post cards were distributed to all mail boxes in 24 states, a new policy was adopted. The statement initiating the new policy was as follows:[9]

"The Bureau must continue to make tests to check the completeness of the registration; but the object of such checks hereafter will be to help the State with its problems of registration rather than to threaten its removal from the registration area. The public must be educated to this new point of view. Regardless of whether a State measures above or below the accepted standard of 90 percent completeness, the data should be compiled and published for scientific investigators. Those who have use of vital statistics can then correct the data for each State according to the relative completeness of registration, as ascertained by satisfactory tests.

"In view of this new policy, the need for better methods of determining the completeness of registration becomes one of the most urgent problems confronting the Division of Vital Statistics. Cooperative effort will be required to develop sampling or other methods which will be relatively inexpensive, which can be repeated in each State year after year and which will be both unbiased and dependable. On the basis of such tests, the States with incomplete registration and inadequate personnel can be encouraged and aided to build up and perfect their systems of registration. If the results from such tests can be used as correction factors, the data on births and deaths from States which have incomplete registration will become almost as useful statistically as those from States with complete registration."

The limited survey-type test described above, though more comprehensive in coverage than the independent-list approach, is at best a temporary expedient, providing measures for separate areas. Biases are introduced by factors such as "literacy" which, in the 1934-1935 test, appeared to be important as a factor associated with incompleteness. Another source of bias in the post-card test is introduced by the fact that it would be natural for persons who had knowingly failed to register a birth to also fail to return the post card admitting the fact. The elimination of these biases is expensive.

[9] *Measures Relating to Vital Records and Vital Statistics; Message from The President of the United States Transmitting Report of the Bureau of the Budget.* House Document No. 242, 78th Congress, 1st Session. Gov. Print. Off., Washington, 1943. p. 108.

House-to-house canvass—census survey. Since what is required is an independent and preferably unbiased source of information for matching to registers, the schedules of the population census immediately suggest themselves.

The tracing of individuals from the population-census records to the birth registers was undertaken in Scotland as early as 1916, when deficiencies in the 1911 Scottish census were investigated by matching census schedules to birth certificates in two registration districts. Identification was achieved in 84 and 81 per cent respectively, but the search was not exhaustive.[10]

Canada. An example of the application of this technique in the form of a nation-wide survey of birth-registration completeness may be found in the test undertaken in Canada in 1931. Recognizing that the amount of labour involved in matching individual census schedules for the infant population of the entire country to birth registrations would be prohibitive, the Canadian authorities selected a representative sample of census returns, the procedure of selection varying from province to province. The results were affected by the non-measurable factors inherent in surveys and matching procedures in general. In view of these considerations, it was thought reasonable "to put the deficiency of birth registrations at not over half the percentage unmatched" or at about 6 per cent.[11]

Between 1931 and 1941 (the date of the next census), evidence had accumulated to show that some improvement had occurred in registration completeness in the areas which showed greatest underregistration at the earlier date. It was decided, therefore, to limit the investigation in 1941 to the districts reporting the least registration completeness in 1931. A total of 7,881 separate entries were checked following the procedure set forth below:[12]

"(i) Information from the birth transcripts was transcribed on to A cards for all the births between January 1, 1940 and June 1, 1941 occurring in the district.

"(ii) The census books for the district were searched for all children enumerated as under 1 year whose parents were living in the district at the time of birth. Where an A card was not found for the child, the particulars were transcribed on to a B card.

"(iii) The census books were again searched for all births not already found.

"(iv) When the parents of the child were found in the census, but not the child, the death transcripts for the preceding year and a half were searched.

"(v) The B cards (i.e., those children whose births had not been traced) were searched for (a) among births occurring at the beginning of June and after the census date and (b) among all recent births in the province concerned.

"(vi) Several checks were carried out to ensure the accuracy of the estimates. The census books were searched a second time by an independent worker to ensure that the census population under 1 was complete. The preparation of tables involved frequent reference back to original data and so minimized errors. Further, all untraced census entries could be compared one by one with all the births in the district not already found in the census, thus reducing to a minimum the entries not traced due to changes in spelling.

"On all cards of children traced through birth transcripts and the census, particulars of child's, father's, and mother's age, racial origin, occupation, etc. were recorded as described on the two different occasions. The checking process thus answered simultaneously three questions for each district chosen, —(a) Of all the births in the 17 months previous to the census, how many were living and not enumerated at the census?; (b) Of all children under 1 year at the census, how many had not been registered?; (c) What discrepancies occurred between data as recorded on the birth transcript and at the census? After the check was completed, lists of untraced names were prepared and the co-operation of the Provincial Registrars was sought to make a further search."

The search in local offices effectively reduced the percentage of untraced births, with the result that underregistration for the period 1940-1942 was finally placed at 2 per cent. There was a variation among provinces from 1 to 5 per cent, but the country as a whole showed about 98 per cent completeness of registration.[13]

Because the test area included only those districts reporting the lowest percentage completeness of registration in 1931, the 1941 sample was not a representative one, and the results must be considered in conjunction with the 1931 survey.

United States of America. Another example of a nation-wide survey is found in the tests of birth registration undertaken in the United States in connexion with both the 1940 and the 1950 censuses of population. These tests, which were carried out as co-operative projects between the Bureau of the Census, the National Office of Vital Statistics, and the state registrars, consisted — like the Canadian tests — in matching records of infants of a specified age enumerated in the census with birth registrations made during the appropriate time period. The 1940 test utilized the four-month period, 1 December 1939 through 31 March 1940 preceding the census date of 1 April 1940; the 1950 test made use of the three-month period, 1 January to 31 March 1950.

The methodology of the 1950 test, as given in the *Public Health Reports*,[14] was as follows:

"The 1950 birth registration test was limited to infants born during the 3-month period, January 1

[10] *Fertility of the Population of Canada, op. cit.* p. 23.

[11] *Ibid.* p. 32. It should be noted that the source mentioned in footnote 12 below cites a revised figure of 5 per cent for the period 1930-1932.

[12] *The Changing Size of the Family in Canada* by Enid Charles. Dominion Bureau of Statistics. Census Monograph No. 1. Ottawa, 1948. Appendix A, p. 260-261.

[13] *Ibid.* p. 290.

[14] "Birth Registration Completeness: United States, 1950" by Sam Shapiro and Joseph Schachter. U.S. Public Health Service. *Public Health Reports.* Vol. 67, No. 6, June 1952. p. 523.

through March 31, 1950. Two sets of independently collected records for these infants were compared to obtain measures of registration completeness, that is, birth records on file were matched against infant cards filled out by Census enumerators during the Decennial Census of Population and Housing in April 1950, for enumerated children born in the first 3 months of the year. Because of the confidential nature of the infant cards, they were handled only by Census personnel or special agents of the Bureau of the Census . . .

"The matching operation consisted of three major phases.

"1. *Matching at the National Office of Vital Statistics.* A punched card containing alphabetical and statistical data was prepared by the National Office of Vital Statistics for each birth record and infant card in the test. The punched cards were collated mechanically using various combinations of common identifying information. When data on these cards were inadequate to establish a match, copies of the original records were examined for confirming evidence.

"About 94 percent of the 780,000 infant cards in the test were matched during these operations. (The 780,000 cards do not represent the exact number of infants enumerated in the census since in some cases the enumerator recorded the child on the basic population schedule but failed to fill out an infant card.)

"2. *Mail survey.* Unmatched infant cards were included in a mail survey designed to verify and correct information on the residual group. The questionnaire was sent to parents and in special cases to welfare organizations and hospitals. Replies to the initial mailing and follow-up letter were received for about 80 percent of the records. These responses resulted in additional matches and in the elimination of infant cards for children born outside the test period.

"3. *State searches.* The 30,000 infant cards still unmatched after the mail survey were sent to State, independent city, and Territorial registration offices for searches against their files. Registrars were authorized to use other sources of information within the limitations of Census and State regulations. Matching records were located for almost half the infant cards sent to these offices. Problems of identification created by illegitimacy, adoption, and other situations resulting in name changes were frequently resolved in this phase."

The results of the test, as well as comparative data for 1940, will be found in the source mentioned above. They are summarized in the following paragraph:

"Preliminary results of a recently completed nation-wide test of birth registration indicate that birth records are now filed by attendants and hospitals for about 98 percent of the babies being born. This represents an important advance since 1940 when only 92.5 percent of the births were registered. Progress made during this period has virtually eliminated underregistration as a practical problem in more than half the country and has sharply reduced the problem in nearly all other areas."

Latin America. The importance of evaluating completeness of registration in Latin America was recognized by the Second Inter-American Statistical Congress, which recommended tests similar to those employed by Canada and the United States.[15]

Resolution No. 15 which embodies their suggestion is as follows:

". . . That in those countries which include in their census a test to determine the degree of effectiveness of birth registration, a check be made of the names of children under a given age on the census schedules with birth and death certificates for the corresponding period.

"That experimental investigations be made to work out satisfactory methods for measuring the extent to which deaths are under-registered . . ."

In accordance with this resolution, Panama and Venezuela undertook nation-wide tests of birth-registration completeness as part of their 1950 censuses of population, while Paraguay took such a test on a sample basis, as did Chile in its 1952 census. The results of the endeavours are not available.

Yugoslavia. Another test of completeness of birth and death registration, which utilized census records in a slightly different way, was a pilot study conducted on an experimental basis in Yugoslavia during 1951. The area chosen for the experiment was three communes in Serbia. During 1951, each head of household enumerated in the 1948 census was questioned on events which had occurred in the three years since the completion of the census schedule. The data on births and deaths collected in this manner were then checked against the records in the civil registers. Since there is practically no migratory movement in the three communes, in theory, these two independent sets of data should have agreed. They did not match exactly, however, the most important reason being that name changes were frequent, and no special effort was made to trace them. Consequently, the study served only to demonstrate another method of obtaining a secondary register of births and deaths from census records and interviews. It also pointed up the advisability of broadening the area included and of instituting follow-up procedures to decrease the number of unmatched names.

Ceylon. Following the last census, which took place 20 March 1953, an island-wide sample verification of the census count was undertaken. At the same time, the completeness of birth and death registration was assessed using the same sample.

The verification survey covered a little over 1 per cent of the population of Ceylon, or a total of 85,415 persons in 16,232 households, 12,254 of which were rural and 3,978 urban. It was carried out between the

[15] *Second Inter-American Statistical Congress, Bogotá, January 1950: Summary and Resolutions.* Preprint from *Estadística,* Journal of the Inter American Statistical Institute, Vol. VIII, No. 26, March 1950. p. 22. See also *Method of Testing in the 1950 Census the Completeness of Birth Registration* by Frank S. Morrison and Adolfo Lola Blen. Inter American Statistical Institute. Committee on the 1950 Census of the Americas. Document No. 448a (COTA) 1/12/49-300, 1949. 10 p. Also, *Utilización de los censos para probar la integralidad del registro de nacimientos.* Inter American Statistical Institute. Committee on the 1950 Census of the Americas. Document No. 988b-5.25.51-500, COTA. Washington, 1951. 23 p.

third week of June (three months after the census date) and the end of September 1953. From each household interviewed, information on the births and deaths which had occurred during the period 1 January-31 March was ascertained and recorded on special forms. These records were then matched to corresponding entries in the official registers.

The survey revealed that for Ceylon as a whole, the percentage completeness of registration for births was 88.1 and for deaths 88.6. In both cases, registration was better in urban than in rural areas. The report on the survey notes that, limited by the errors to which they are subject, these values may be regarded as prescribing the maximum deficiency of birth and death registration in Ceylon.[16]

India. Examples of the application of the house-to-house-canvass approach on a regional or local basis can be found in other parts of the world. One of the most interesting of these is a local test carried out in 1947 in the Singur Health Centre area in India. This investigation, which covered about 64,000 persons in 68 villages, consisted of an interview survey of families to obtain a list of births and deaths which had occurred during 1945 and 1946. This list of names was then checked to the registers of birth and death for those years. The comparison of the two lists of names presented many difficulties arising from illegibility, incomplete entries, and so forth, but it resulted in rough estimates of completeness of birth registration in 1946, ranging from about 56 to 74 per cent, and of death-registration completeness of about 45 to 60 per cent in the same year.[17]

A sample survey of households in Uttar Pradesh, covering 7,722 villages in 44 of the 49 districts, was carried out in 1949 by the Statistical Department of the State Government through the district health officers. Underregistration of births was estimated at 29.5 per cent, while that for deaths was placed at 24.3. However, there is some evidence that these omission percentages may be too low.[18]

Similar household sample surveys have been carried out with varying results in West Bengal (1948), Madras (1952), Travancore-Cochin (1948), Bombay (1952), Madhya Pradesh (1952), and Punjab (1953).[19]

Another house-to-house canvass was carried out during 1951-1952 in the Bangalore area of Mysore State by the United Nations and the Government of India in connexion with a co-operative pilot field study of methods for evaluating the interrelationships of demographic, economic, and social factors. This survey was conducted to determine the levels of natality and mortality — information necessary for conduct of the study but not produced by the registration method. The method used consisted in careful interviews of a sample of households with a view to determining, among other things, data on births and deaths which occurred among members of the household and visitors after 15 September 1950. The reports of births and deaths so collected were checked to the civil registers and estimates of underregistration were derived, but results are not yet available. For a description of the method, see references cited below.[20]

Others. Similar tests on a very small scale have been carried out in connexion with United Nations and World Health Organization training centre activities as, for example, that undertaken in the Health Centre of Quinta Normal in the City of Santiago, Chile;[21] and another in the town of Nuwara Eliya in Ceylon.[21]

Limitations of the survey-type tests. The general limitations of the enumeration or survey method as a means of obtaining information on births and deaths have been set forth in detail in chapter I. Suffice to say here that this method suffers primarily from the unreliable nature of memory as a source of information. A similar limitation, especially important in relation to deaths, is the disappearance or disintegration of the family as a result of the death being investigated and the consequent lack of a source for information.

Tests of completeness such as those described above are desirable from a technological viewpoint, but the fact that they are expensive cannot be ignored. Record-matching operations are always expensive in terms of clerk time. If the records to be matched are not accurate and legible, the difficulties are multiplied. In countries where infants are not named immediately at birth, or where name changes or multiple names are usual, the problems of matching may be almost insoluble. Moreover, in areas where internal migration is prevalent, it may be difficult to locate the proper records. And in all countries where there is a large amount of delayed registration, i.e., precisely those in which an evaluation of completeness is most necessary, it is obvious that many infants recorded in the census may not be registered at the time of the search. Finally, the criteria for matching are not easily fixed. If they are too rigid or too lax, the purpose of the survey will be defeated at once. As varying degrees of laxness are introduced in an effort to dispose of residual groups of unmatched records, the possibility of jeopardizing the matchability of those remaining increases.

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[16] *Post Enumeration Survey 1953.* Department of Census and Statistics. Monograph No. 1. Gov. Press, Ceylon, 1953. p. 3, 16, 17.

[17] "On a Method of Estimating Birth and Death Rates and the Extent of Registration" by C. Chandra Sekar and W. Edwards Deming. *Journal of the American Statistical Association.* Vol. 44, No. 245, March 1949. p. 101-115.

[18] *Methods for Improving the Quality of Health and Related Vital Statistics—Need for Investigation, Demonstration and Other Promotional Activities for Securing Co-operation from Persons Concerned with Supplying the Needed Data* by R. B. Lal. Document WHO-UN/Conf.Nat.Com./30, 21 September 1953. p. 2. Mimeo.

[19] *Estimation of Birth and Death Rates in India During 1941-50—1951 Census, op. cit.* p. 6-9.

[20] *Studies of Interrelationships of Demographic, Economic, and Social Factors in Particular Areas: India, Other Possible Areas.* United Nations document No. E/CN.9/76, 20 March 1951. 6 p. Mimeo; and *Use of Household Sample in the United Nations—Government of India Population Study in the Mysore State* by C. Chandrasekaran. United Nations document No. E/CONF.13/322. 24 p. Mimeo.

[21] An abbreviated discussion of these tests, their objectives, methods, and the forms used will be found in *Report on the Inter-American Seminar for Biostatistics.* United Nations. Statistical Office. Statistical Papers, Series M No. 9, May 1951; and *Report on the International Training Centre on Vital Statistics and Health Statistics for South-East Asia.* United Nations. Statistical Office. Statistical Papers, Series M No. 12, 1 March 1952.

All of the limitations noted above should be considered carefully before such tests are undertaken. The measures obtained from less expensive checking procedures are almost always adequate for promotion of more complete registration in so far as it can be accomplished by working with the public and with interested and responsible agencies. Once the problem is defined in general terms, efforts should be expended toward improvement of registration rather than to excessive precision of measurement.

C. Testing completeness of statistical reporting

There has been a tendency in the past to blame deficiencies in vital statistics solely on registration completeness or incompleteness. "Incompleteness of registration" has become synonymous with "incompleteness of statistics", although statistics are not compiled directly from registration records in any country. In every country, as noted in chapter VIII, there is another step between the registration and compilation known as "statistical reporting". In a few countries, this step consists of making a photograph of the registration record and sending the photograph or microfilm image to the statistical service. In others, it may mean filling out a special statistical report which can be a list, an abstract, a duplicate of the original, or another form altogether. Whichever method is adopted, failure to transcribe or transmit a report can occur or duplicates can inadvertently be made, with the result that the number of vital events reported may differ from the number which were registered. Thus, it is evident that apparent deficiencies in the quantitative aspects of vital statistics are not necessarily due to underregistration alone; they may be due to underreporting, or to a combination of underregistration and underreporting.

The only exact method of determining the degree of completeness with which reports of vital events are transmitted is to identify each statistical report with its registered counterpart, that is, to require transcription of the registration number which will permit checking — record by record. There are, however, less exact tests which can be applied to determine whether either underregistration, underreporting, or both are resulting in incomplete statistics. These are primarily the checks which are based on comparison of frequencies or rate levels.

1. By comparison of aggregates

The routine comparison of frequencies, i.e., the checking of the numbers of live births, deaths, marriages, and divorces reported each week, month, or quarter, has the same basis as the comparison of the number of events registered, recommended above. This crude test is predicated on the principle that, from month to month or from year to year, the number of vital events occurring are sufficiently stable or change slowly enough to permit a check which would detect gross omissions in reporting. Constant scrutiny of the returns from the reporting areas and the setting up of "expected" quotas will reveal at least startling deficiencies in statistical reporting. The reporting of totals which fall significantly below the expected number should call for investigation.

The complete absence of reports from any area should be an indication of a break-down in the system of reporting. Such an example has been reported from Greece where, of the 5,974 communes and municipalities in the reporting area, 18.5 per cent failed to send data in 1951 and 16.2 per cent in 1953. It may be noted also that under normal circumstances and relatively complete registration and reporting, two to three births may be expected for every death, depending on the type of culture under consideration. If the proportion normal for the area is not maintained, there may be reason to suspect underreporting of either births or deaths, depending on the direction of the deficit.

2. By comparison of rate levels

Just as violent fluctuations in the number of vital events which occurred in a stable population are not to be expected, sudden changes in crude rates of occurrence for one area, or large differences for similar areas, may indicate deficiencies in the basic data. In the case of rates, these deficiencies may be in the numerator or in the denominator, or in failure to define these elements correctly. Assuming for purposes of illustration that the basic data are not faulty, a very good example of the use of rate levels to indicate incompleteness of either registration or reporting is available for Thailand. The incompleteness evident in Thailand's birth and death data for 1947 and 1948 is revealed in the variations of rates between provinces in any one year and between rates for two successive years in any one province. Since there are 71 provinces, it is not feasible to reproduce all the data, but those for the first ten provinces are shown in the table below to illustrate the variations:

Table H. Official birth and death rates by province; 2490, 2491 (1947, 1948)

	2490 census population numbers	*Crude birth rates*		*Crude death rates*	
		2490	*2491*	*2490*	*2491*
Kingdom of Thailand	17,442,689	23.70	24.43	13.43	10.89
Province					
Bangkok	889,538	30.42	37.48	14.61	13.13
Thonburi	289,343	29.07	38.57	17.72	17.09
Ayuthya	373,889	21.70	22.28	16.10	10.36
Lopburi	202,041	17.81	18.92	10.95	8.53
Chainat	170,962	14.17	11.43	9.64	5.19
Singh-buri	115,669	26.05	23.53	16.90	9.87
Ang-thong	150,515	20.71	17.57	16.72	9.41
Sara-Buri	207,051	16.55	17.38	12.42	8.10
Pathun-thani	142,488	17.28	16.06	11.58	5.51
Nonthaburi	133,623	30.15	29.60	24.14	16.82

It would seem quite unlikely that two provinces in the same relatively homogeneous country could have birth rates in 1948 as different as 11.43 and 37.48 (Chainat and Bangkok) or death rates of 5.19 (Chainat) and 17.09 (Thonburi) for the same year. These variations seem to suggest that they refer to *occurrence* rates rather than to residence rates, which would account for the high level of those for Bangkok and Thonburi; but changes between 1947 and 1948 from 30.42 to 37.48 (Bangkok) or from 29.07 to 38.57 (Thonburi) seem to call for another explanation. Field work in Thailand established the fact that many reporting areas continually fail to send reports of births and deaths, but that no account is taken of these deficiencies in computing the rates. The result, of course, is that the rates fluctuate over a wide range from year to year.

The method of drawing conclusions about underregistration or underreporting from comparison of birth and death rates for two adjacent areas in the same country may be extended to the evaluation of rates for two separate countries, provided that the areas are considered sufficiently similar in economic, social, and cultural conditions. Wide variations in rates for geographic areas of similar culture and economic development cannot often be explained on the basis of differences in definition alone. Almost always, such differences represent in part deficiencies in registration completeness or incompleteness of statistical reporting. These comparative deficiencies can be illustrated by a comparison of the crude birth rates for India and Ceylon. In 1948, India reported a crude birth rate of 25.2, while Ceylon showed a rate of 40.6. A difference such as this in two countries as closely related in culture and economy as Ceylon and India seems difficult to explain on any basis but underregistration and/or underreporting. Actually, it is known that both registration and reporting are markedly deficient in most of India, while these two functions are carried on at a high level of completeness in Ceylon.

Rate comparison is admittedly a crude and subjective method of testing but, in the absence of any other type of test, it may give some indication of the degree of completeness of either registration or reporting or both.

D. Utilization of measures of completeness

The measure or degree of incompleteness of registration or reporting is of little value by itself. Because of the errors likely to be involved, such indexes cannot often be used to correct birth or death figures.[22] Moreover, the years for which measures usually are obtainable are only those proximate to the census, and adjustment factors derived from them cannot continue to be used indefinitely.

The real value of percentages of underregistration or underreporting lies in their utilization to initiate remedial measures and to promote registration and reporting completeness. One example may be cited. Immediately following the 1940 test of birth registration, the United States carried out a nation-wide improvement campaign laying emphasis on the areas of the country where registration was especially poor. Use was made of the radio and lecture platforms to emphasize, with the assistance of maps, the inadequacy of registration in different parts of each state. The results of the 1950 test show conclusively that improvement has taken place throughout the registration area. It may be of interest to examine more closely the steps taken by one state to accomplish this improvement.

TENNESSEE PROGRAMME

In 1940, the State of Tennessee showed a per cent completeness for birth registration of 80.4. The 1950 preliminary results indicated that Tennessee had increased completeness relatively more than any other state in the Union, to a level of 96.7 per cent. How was this change accomplished? In the words of the author of an article on this subject,[23] "The improvement of birth registration in Tennessee was due to the concerted efforts on the part of registration and health workers throughout the State". The individual steps taken involved many different aspects; the first, which deals with the "Consolidation of Registration Districts", touches on the factors of (1) the number and placing of registration units, (2) qualification of the registrar, (3) better relationships with the informant, (4) training of registrars, and (5) co-ordination. The following paragraphs emphasize the importance of incentives to registration (in the case of Tennessee during the war period 1941-1945, the "incentive" took the form of the requirement that a birth be registered before a ration book could be obtained), the emphasis on a field programme, pamphlets, promotional educational activities, the need for follow-up and checking to hospital lists, etc. The individual steps as described by the author are reprinted below:

"Consolidation of Registration Districts

"This work began in 1937 and continued through 1945. The number of local registrars was reduced from 756 to 96 and registration was placed in the local health department with the health officer, the local registrar, and the clerk deputy registrar. The consolidation provided better supervision and improved qualifications of the local registrar. Better relationship with persons responsible for registration was established, also. Great credit must be given to the fact that the change from lay personnel to local health department personnel improved registration to a marked degree. Special training was given the clerks of the local health departments through the Clerical Training School. The three and one-half days assigned to vital statistics have added much to the registrar's efficiency. Our monthly publication, *The Spotlight,* has been a source of aid to the registrar. *The Spotlight* shows the number of certificates filed monthly by each county, with special mention of counties with particularly low rates and other interesting facts concerning registration.

"Cooperative Plan With Local O. P. A. [Office of Price Administration] Offices

"This provided for proof of birth registration prior to issuance of ration books for infants. Through a cooperative plan with the O.P.A. offices, ration books were not issued unless the board was presented with a card showing the infant's birth had been registered. These cards were issued by the local registrar on the request of the parents. You may be interested to know that 'Numerical increases in registration on a county basis ranged up to 55 percent with no decreases occurring in any county during that time.'

"Increased Emphasis on the Field Program

"The number of full-time field consultants was increased from one in 1937 to three in 1948. Our field program has included the training of registrars; promotion of better working relationship between local registrars and attendants; provided for personal contacts with parents and attendants to obtain unre-

[22] Percentage completeness of registration is used in adjusting birth and death data for the computation of life tables and sometimes for estimating true levels of natality and mortality, as has been done for some states of India.

[23] "Steps Taken to Improve Registration in Tennessee" by Carrie Hill. *The Registrar.* Federal Security Agency. Public Health Service. National Office of Vital Statistics. Washington, Vol. 17, No. 8, 15 August 1952. p. 29.

ported birth certificates; promoted educational activities through lectures, newspaper articles, pamphlet distribution, and conferences with physicians, nurses, and midwives. Pamphlets, 'Birth Registration in Tennessee,' have been widely distributed to high school children and community groups. Our program has also included surveys to determine completeness of registration at the local level. These surveys included: distribution of cards to school children and parents to check for current births; family birth record check (through schools) over a period of several years to determine present and past completeness of registration; and field surveys in rural areas (house to house, etc.) to locate unrecorded events.

"Promotion of Activities in the Local Health Department

"More emphasis was placed on follow-up on unreported births and personal contact with registration personnel on a local level. Information for unreported birth file was secured by checking hospital reports, prenatal and nursing records. Attendants, physicians, and midwives were contacted personally or by mail to obtain the certificates. Clerks in many counties prepared certificates for midwives' signatures. Public health nurses have assisted by reporting cases where birth certificates have not been filed and by contacting midwives in rural areas. Family health records were routinely checked to determine if children under one year of age had birth certificates.

"Promotion of Activities in the Central Office

"Special emphasis was placed on unreported births. Hospital reports were checked monthly and a letter sent to the attendant on each unreported birth. If the certificate was not filed within thirty days, follow-up letters were sent. In instances when a birth certificate which was not acceptable for filing was received, care was taken to see that a new properly prepared birth certificate was submitted and filed. Infant death certificates were matched with birth certificates to determine if birth certificates had been filed. Greater determination was exercised by the Central Office to assist the local registrar, in every way, to file a certificate for every birth occurring in his area.

"Expansion of an Educational Program

"This included radio and newspaper publicity, State and local fair exhibit, distribution of pamphlets, participation in training programs, field consultant service to all counties and soliciting cooperation through public addresses to organizations and agencies . . ."

E. Evaluating quality of data

It has been shown that it is possible to gain a rough idea of the inadequacy of the statistics by comparison of total frequencies or rate levels. A more exact idea of the quality of the data may be obtained by the matching of items of information, and by the careful examination of trends and the distributions of various characteristics.

1. By item-matching technique

Although examples are not too numerous, there are indications that the matching of records can produce not only measures of gross deficiencies but also indications of the accuracy with which separate items of information are reported.

An example of the application of the matching techniques for evaluating quality of data is one in which live-birth reports which contained information on birth weight and period of gestation were checked against the corresponding clinical hospital records to determine the degree of correspondence.[24] In another case, the occupation item on the death reports was checked back to the schedules of a population census to ascertain the degree of correspondence.[25] In still other instances, cause-of-death reports have been followed back to hospital records to establish the complete clinical history, or to autopsy records for verification of the exact cause of death.[26] All such comparative studies have been on a relatively small scale, but they do indicate precise methods of evaluating the accuracy of the reported data.

2. By analysis of trends and frequency distributions

Tabulated data should always be subjected to a technical review of a searching nature, designed to ensure that frequencies, both the aggregates and those in various classes, are historically credible and consistent internally. Each statistical series exhibits certain clearly defined temporal tendencies; any marked variation from these historical patterns might indicate need of study. Since the nature of the relationship between one category of a distribution and another does not change markedly from one year to the next, any wide divergence from the established levels should be an indication of potential deficiency.

(a) *Heaping*

The technical review mentioned above has as its goal the clarification of the series by means of explanatory notes and the eventual improvement of the statistics by elimination of the causes of errors. It is known that certain of the anomalies of a series may be caused by reporting practices. For example, a distribution of deaths by age may reveal marked heapings at ages ending in 0 and 5 and a preference for ages ending in even digits, such as two and eight. This uneven distribution is due to the well-known tendency to report ages incorrectly. The problems of "heaping" are particularly important to actuaries who are concerned with computation of life tables, the underlying data of which are subject to digit preference in reporting of ages. Consequently, several methods have been devised to study the nature of the heaping and to eliminate its effect by various forms of mathematical smoothing and interpolation.

One analysis of the nature of heaping in a distribution of deaths by age was made by Greville[27] using the

[24] "Birth Weight and Length of Gestation with Relation to Prematurity" by Matthew Taback. *Journal of the American Medical Association.* Vol. 146, No. 10, 7 July 1951. p. 897-901.

[25] "Occupation Entries on Death Certificates Studied" (study carried out in the School of Hygiene and Public Health of Johns Hopkins University, Baltimore, Maryland). *The Registrar.* Federal Security Agency. Public Health Service. National Office of Vital Statistics. Washington, Vol. 14, No. 11, 15 November 1949. p. 1.

[26] "Diagnostic Pitfalls Identified During a Study of Three Thousand Autopsies", by Richard C. Cabot. *Journal of the American Medical Association,* December 1912. Also "Diseases and Deaths; A Statistical Survey of 40,130 Autopsies at the Los Angeles County General Hospital, 1918 to 1948" by Emil Bogen and Edward M. Butt. *California Medicine.* Vol. 79, No. 1, July 1953. p. 16-19.

[27] *United States Life Tables and Actuarial Tables 1939-1941* by Thomas N. E. Greville. Department of Commerce. Bureau of the Census. Gov. Print. Off., Washington, 1946. p. 121.

Myers' blended method.[28] Mr. Greville analysed both the 1940 census of population and the 1935 deaths in the United States by race. Some of the results are given in table I below:

Table I. Preference for digits of age by race and sex, in the United States, for 1935 deaths and 1940 census populations: numbers reported at each digit of age as percent of total number

Digit of age	1935 deaths					1940 population				
	Total deaths	White		Nonwhite		Total population	White		Nonwhite	
		Male	Female	Male	Female		Male	Female	Male	Female
0	11.1	10.5	10.6	15.8	15.9	11.6	11.0	11.5	14.6	15.0
1	8.7	9.0	8.9	7.4	7.3	8.5	8.8	8.6	6.8	6.3
2	10.0	10.0	10.0	9.8	9.6	10.4	10.5	10.4	10.1	9.9
3	9.7	9.9	9.8	8.4	8.4	9.6	9.8	9.6	8.3	8.2
4	10.1	10.2	10.3	8.9	9.1	9.7	9.9	9.8	9.0	8.8
5	11.4	11.0	10.9	14.5	14.1	10.7	10.5	10.6	12.5	12.4
6	9.6	9.7	9.8	8.4	8.6	9.6	9.7	9.7	9.0	9.0
7	9.6	9.8	9.7	8.2	8.4	9.6	9.7	9.6	8.8	8.7
8	10.1	10.1	10.1	9.7	9.7	10.3	10.1	10.3	10.6	11.2
9	9.7	9.8	9.9	8.9	8.9	10.0	10.0	9.9	10.3	10.5
Index of preference[a]	5.4	3.6	3.8	20.6	20.0	6.0	4.2	5.6	16.2	18.2

[a] Sum of deviations from 10 percent, taken without regard to sign.

In the words of the author:

"In interpreting the table, it should be noted that the extent of heaping or deficiency at any particular digit is indicated by the amount by which the percent shown for that digit differs from 10 percent. The 'index of preference', which is the sum of the absolute deviations from 10 percent, is a useful general measure of the amount of bias present. The smaller the index, the less error is present, since if there were no bias, all the percentages would be exactly 10 percent, and the index would be 0."

An analogous digit preference is revealed in a distribution of gestation period where excessive frequencies may be found at 36 and 40 weeks,[29] heapings often due to incorrect calculation of the period. In cause-of-death distributions, excessive frequencies in the "senility" category will certainly cast some doubt on the validity of the reported causes of death. In a distribution of births by age of mother, a large number reported in the over-45-years-of-age category will probably indicate that the tabulation has been made on a date-of-registration basis rather than by date of occurrence. These are all evidences of the necessity for constant scrutiny of series and distributions for internal consistency and credibility, and for experimentation and adaptation of tests to reveal and to eliminate the effects of the biases.

(b) *Extent of unknowns*

A related point to be considered in evaluating the quality of a distribution is the number of observations recorded as unknown or not stated. If the number of items in the unknown category of a distribution is relatively large, the remainder of the distribution cannot fail to be invalidated to some degree. For some characteristics, such as age, assumptions are sometimes made as to the probable values of the unknowns and they are distributed throughout the known categories. For other characteristics such as period of gestation, weight at birth, and cause of death, such assumptions are more difficult to make. Hence, distributions of these and similar attributes may be of little value for any but the roughest approximations if the frequency in the unknown category is large. This point should be borne in mind in evaluating tabulated data for analytical purposes.

3. By analysis of special tabulations

The use of certain tabulations as an aid to evaluation of the vital-statistics system has been mentioned previously. They have also been set forth as a means of evaluating the vital-statistics system in a United Nations Principle[30] which reads as follows:

"411. *Tabulations necessary for the administration of the vital registration system*

"In addition to the tabulations mentioned in Principle 410 (*e*), provision should be made to tabulate items which evaluate the efficiency of the registration system. Such tabulations would be utilized in the analysis of vital statistics and would serve as a guide for the improvement of services."

Special attention has been called previously to the cross-classification of births by date of occurrence and date of registration — a distribution utilized to evaluate the lag in registration over and above the statutory period allowed. The necessity for making and using such an analysis periodically if "date of registration" is used as a basis for tabulation, was also stressed.

In addition to the occurrence-registration tabulations mentioned above, there are others of even more specific utility for evaluation purposes. One of these is the tabulation of deaths by type of certification. Even without the cause-of-death classification, subdivision of deaths by medical and lay certification of cause will give a clear indication of the potential accuracy of the data. A further classification by cause of death will reveal the causes which cannot be used with any degree of certainty, that is, those which show a small proportion medically certified. If this tabulation is made by small geographic areas, the problem will be even more closely delineated. A further refinement would involve the subdivision of medical certification into that given by the attending doctor, by the doctor who only examined the body after death, by the doctor performing the autopsy. Such refinements have little applicability except in connexion with certain hospital cases, but the

[28] "Errors and Bias in the Reporting of Ages in Census Data" by Robert J. Myers. *Transactions, Actuarial Society of America,* Vol. 41, Part 2, No. 104, October-November 1940. p. 395-415. See especially p. 402-407. 411-415.

[29] "Birth Weight and Length of Gestation . . ." by Matthew Taback, *Op. cit.*

[30] *Principles for a Vital Statistics System, op. cit.* p. 23.

classification of cause of death according to "medical" versus "non-medical" certification is indispensable to the evaluation of the vital-statistics system.

In the field of natality, the tabulation of period of gestation by weight at birth may serve to evaluate the accuracy of the reported values, inasmuch as there is a high correlation between the two variables. Tabulation of any two characteristics which are related in a well-defined pattern, as for example age with marital status, with level of education, number of children born, and so forth, may also reveal inaccuracies in basic data. Cross-tabulation of occupation and industry, as well as the analysis of these attributes in connexion with status, may indicate reporting errors in this very complex field.

These are but a few of the special tabulations which may serve to indicate to some extent the quality of the basic data. Others will suggest themselves in relation to special national problems, but some such evaluation tabulations should be incorporated into every well-planned vital-statistics system.

ANNEX 1

CHRONOLOGY OF IMPORTANT EVENTS IN THE DEVELOPMENT OF CIVIL REGISTRATION AND VITAL STATISTICS

Year	*Area*	*Remarks*
Circa 1250 B.C.	Egypt	Early in the reign of Egyptian King Rameses II, there appears to have been in force a somewhat elaborate registration system. Whether at that remote time it applied equally to all classes of the population would seem doubtful, but where the system did apply it would scarcely have excluded records of births and deaths.
578-534 B.C.	Rome	Citizens were required to give account of newly born children within 30 days of birth, while officials were appointed throughout the provinces for the purpose of recording the relevant facts relating to births, adolescents, and deaths.
A.D. 720	Japan	Registration of live births, deaths, and marriages compulsory in some parts of Japan.
Circa 1400	Jordan	Registration of marriage and divorce compulsory.
1406	France	"Registration is specifically mentioned in the statutes of Henri le Barbu, Bishop of Nantes, the *raison d'être* of such registrations being to furnish proofs of kinship, and so provide a means of enforcing the rules of ecclesiastical law which forbade the marriage of relatives."
Circa 1450	Spain	"Cardinal Ximenes, Archbishop of Toledo, provided for introduction of registers which were regularly maintained by parish priests."
1501	Germany	First regular and continuous registration of live births, deaths, and marriages in German cities started in Augsburg.
1521	Egypt	Compulsory registration of marriage and divorce established.
1532	England	Ordinance required "Bills of Mortality" which were weekly records of burials issued by the clergy of the Established Church containing data relating to the number of deaths, and deaths from plague, in the various parishes of London.
1538	England	Every priest of the Established Church of England was required to keep a book or register in which should be recorded "every Sunday in the presence of the Wardens or of one of them, every wedding, baptism, or burial occurring in the parish during the previous week."
1539	France	Ordinance of Villers-Cotterets required maintenance of registers of baptisms and of burials of parish members.
1554	Peru	Spanish historian Sarmiento wrote of the provincial returns of births and deaths, etc., made to the capital city of Cuzco, Peru.
1563	Europe	Council of Trent made keeping of registers a law of the Catholic Church, prescribed the registration of marriages and baptisms, and thus stimulated the general adoption of civil registration practices throughout Europe.
1579	France	Ordinance of Blois renewed the ordinance of 1539, extending it to cover marriages and to include registration of burials among all religious sects.
1590	England	Proposal submitted to Lord Burghley outlining the advantages of establishing a general register for the whole country.
1597	England	Convocation of Canterbury required inscription of parish registers on parchment, the preparation of duplicate copies of all entries, weekly entries to be read aloud by parish priest each week at conclusion of one of the Sunday services when the names of the clergyman and church wardens were to be inscribed at the foot of each completed page of the register and a copy of each register to be forwarded at the end of each year within one month after Easter to the Bishop of the diocese for preservation among the episcopal archives.
1608	Sweden	Beginning of oldest parish register in Sweden.
1617	Ireland	Appointment of first known Registrar General of Births, Marriages, and Burials—Sir George Keare. Continued only three years and no records are extant.

1619	Ireland	Oldest parish register in world appears to be that at St. John's, Dublin.
1620	Canada	Ecclesiastical registration of baptisms, burials, and marriages instituted.
1628	Finland	Compulsory civil registration of live birth, death, stillbirth, and marriage established.
1634	Ireland	Instruction of 46th Canon of Irish Church required "Every parish church (Established church only) and chapel within this realm shall be provided with one parchment book at the charge of the parish wherein shall be written the day and year of every christening, marriage, and burial."
1635	Japan	Buddhist temple registers of births, deaths, and marriages established.
1639	United States of America (Massachusetts Bay Colony)	Civil registration of birth, death, and marriage required in new colony.
1646	Denmark	Compulsory civil registration of live birth, death, stillbirth, and marriage established.
1653	England and Ireland	Parliament provided registration of marriages, births, and deaths in each parish by a secular registrar, appointed by the Justice of the Peace. This civil system did not survive the Restoration in 1660.
1658	Ireland	Earliest known reference to existence of Irish Bills of Mortality in Dublin.
1662	England	John Graunt published results of his studies under title *Natural and Political Observations . . . made upon the Bills of Mortality*—the first real study in vital statistics.
1670	France	Initiation of annual publication of number of baptisms, marriages, and burials in Paris.
1671	Netherlands	Johan de Witt used data from death registers in certain Dutch cities to determine principles of annuity insurance.
1681	Ireland	Sir William Petty's "Observations upon the Dublin Bills of Mortality" appeared.
1685	Norway	Compulsory civil registration of birth, death, stillbirth and marriage established.
1686	Sweden	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1693	England	Edmund Halley read before the Royal Society his paper "An Estimate of the Degrees of the Mortality of Mankind Drawn from Curious Tables of the Births and Funerals in the City of Breslau; with an attempt to ascertain the Price of Annuities upon Lives".
1735	Iceland	Compulsory civil registration of live birth and death established.
1748	Sweden	Establishment of regular systems of vital statistics.
1772	France	Introduction of regular collection of data relating to births, deaths, and marriages with the intention that these data should be published annually.
1784	Austria	Compulsory civil registration of live birth, death, stillbirth, and marriage established.
1784	Czechoslovakia	Compulsory civil registration of live birth, death, stillbirth, and marriage established.
1784	Hungary	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1787	France	Declaration of Louis XVI provided that vital records for Protestants should be kept by justices of the peace, the Edict of Nantes having been repealed in 1685.
1791	Scotland	"The Statistical Account of Scotland" published by Sir John Sinclaire.
1792	France	Compulsory registration of live birth, death, stillbirth, marriage, and divorce established.
1793	Monaco	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1795	Canada	System of registration by Roman Catholic clergy extended to Protestant congregations by the Act of 1795.
1796	Belgium	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1803	Luxembourg	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1811	Netherlands	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1818	Italy	Vital statistics returns began to appear in Grand Duchy of Tuscany.
1825	Belgium	Publication of "Mémoire sur les Lois de Naissances et de la Mortalité à Bruxelles" by Quetelet—his first statistical paper.
1833	England	Select Committees, appointed to report on general state of parochial registers, recommended national civil registration of birth, death, and marriage.
1837	England	Births, Marriages and Deaths Registration Act, which became effective 1 July 1837, provided for voluntary registration of live births, deaths, and marriages.
1839	Egypt	Compulsory civil registration of live birth and death established.

1839	**England**	Dr. William Farr appointed to the General Register Office as Compiler of Abstracts.
1842	**Massachusetts**	Registration Law put into effect. Earliest, promising, and reasonably successful statute dealing with registration among American states.
1845	**Northern Ireland**	Compulsory civil registration of non-Catholic marriages established.
1852	**Peru**	Compulsory civil registration of live birth, death, marriage, and divorce established.
1855	**New Zealand**	Compulsory civil registration of live birth, death, and marriage established.
1855	**Scotland**	Compulsory civil registration of live birth, death, and marriage established.
1859	**Mexico**	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1863	**Venezuela**	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1864	**Ireland**	Compulsory civil registration of live birth, death, and marriage established.
1864	**Northern Ireland**	Compulsory civil registration of live birth, death, and Roman Catholic marriage established.
1865	**Italy**	Compulsory civil registration of live birth, death, stillbirth, and marriage established.
1869	**Surinam**	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1871	**Ceylon**	Compulsory civil registration of Kandyan marriage and divorce established.
1871	**Spain**	Compulsory civil registration of live birth, death, stillbirth, and marriage established.
1874	**Poland**	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established. in parts of country.
1875	**England and Wales**	Compulsory civil registration of live birth, death, and marriage established.
1876	**Germany**	Promulgation of Federal Law of 6 February 1875 (effective 1 January 1876) provided for compulsory civil registration of live birth, death, stillbirth, and marriage in all federated states and establishment of civil registry offices in all areas.
1876	**Switzerland**	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1877	**Guatemala**	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1879	**El Salvador**	Compulsory civil registration of live birth, death, marriage, and divorce established.
1879	**Nicaragua**	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1879	**Uruguay**	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1882	**Honduras**	Compulsory civil registration of live birth, death, marriage, and divorce established.
1884	**Dominican Republic**	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1885	**Austria**	Compulsory civil registration of divorce established.
1885	**Chile**	Compulsory civil registration of live birth, death, stillbirth, and marriage established.
1885	**Cuba**	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1886	**Burma, India, and Pakistan**	"Births, Deaths and Marriages Registration Act" provided for *voluntary*, not compulsory, civil registration.
1888	**Costa Rica**	Compulsory civil registration of live birth, death, stillbirth, and marriage established.
1889	**Brazil**	Compulsory civil registration of live birth, death, stillbirth, and marriage established.
1890	**Finland**	Compulsory civil registration of divorce established.
1897	**Ceylon**	Compulsory civil registration of live birth, death, and stillbirth established.
1898	**Japan**	Compulsory civil registration of live birth, death, marriage, and divorce established.
1898	**Paraguay**	Compulsory civil registration of marriage established.
1901	**Ecuador**	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1911	**Bolivia**	Compulsory civil registration of marriage established.
1911	**Portugal**	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1912	**Egypt**	Compulsory civil registration of stillbirth established.
1913	**New Zealand**	Compulsory civil registration of stillbirth established.
1914	**Panama**	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1914	**Paraguay**	Compulsory civil registration of live birth and death established.
1914	**Syria**	Compulsory civil registration of live birth, death, marriage, and divorce established.
1914	**Turkey**	Compulsory civil registration of live birth, death, and marriage established.

1916	Thailand	Compulsory civil registration of live birth, death, and stillbirth established.
1919	Israel	Compulsory registration of marriage and divorce established.
1920	Israel	Compulsory civil registration of live birth, death, and stillbirth, established.
1922	Haiti	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1925	Greece	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1925	Lebanon	Compulsory civil registration of live birth, death, marriage, and divorce established.
1926	Jordan	Compulsory civil registration of live birth and death established.
1926	Liechtenstein	Compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1927	England and Wales	Compulsory civil registration of stillbirth established.
1928	Jordan	Compulsory registration of marriage and divorce established in modern form.
1931	Philippines	Compulsory civil registration of live birth, death, stillbirth, and marriage established.
1932	Bolivia	Compulsory civil registration of divorce established.
1935	Thailand	Compulsory civil registration of marriage and divorce established.
1937	Ceylon	Compulsory registration of Moslem marriage and divorce established.
1938	Colombia	Compulsory civil registration of live birth, death, and marriage established.
1939	Scotland	Compulsory civil registration of stillbirth established.
1940	Bolivia	Compulsory civil registration of live birth, death, and stillbirth established.
1946	Japan	Compulsory civil registration of stillbirth established.
1946	Paraguay	Compulsory civil registration of stillbirth established.
1946	Poland	Nation-wide compulsory civil registration of live birth, death, stillbirth, marriage, and divorce established.
1946	Yugoslavia	Compulsory civil registration of live birth, death, stillbirth, and marriage established.

ANNEX 2

PRINCIPLES FOR A VITAL STATISTICS SYSTEM

RECOMMENDATIONS FOR THE IMPROVEMENT AND STANDARDIZATION OF VITAL STATISTICS

Introduction

Background

1. National statistical services should provide adequate statistics, including vital statistics, which can be the basis for informed national decisions on economic and social matters and which can meet international responsibilities in the field. In recognition of their basic importance, and in accordance with the Council resolution 2/8 adopted on 21 June 1946, by which the functions of the Statistical Commission, as set forth in its terms of reference, include "promoting the development of national statistics and the improvement of their comparability", and resolution 41 (IV) on "Improvement of Comparability and Quality of Basic Population Statistics", the Statistical Commission took under consideration, at its fourth session in 1949, the development and improvement of national vital statistics and their comparability.

2. Comparability can only be achieved through the adoption and implementation by all nations, in so far as their individual requirements permit, of the same general concepts and definitions. Therefore, at its fifth session in 1950, the Statistical Commission recommended that "detailed draft recommendations for the improvement and standardization of vital statistics" be prepared (E/1696, para. 88). The Population Commission endorsed this proposal (E/1711, para. 46) and noted that the implementation of these recommendations would improve mortality, fertility and other population data necessary for the study of basic demographic problems and the interrelationships of demographic, economic, and social factors.

3. Preliminary draft recommendations were considered by the Statistical and Population Commissions at their sixth sessions in 1951. On their recommendation, the document was circulated during 1951 to all Members of the United Nations, to other nations which might be expected to provide comment and to the specialized agency with particular interest in the matter, namely the World Health Organization. The "Principles for a Vital Statistics System" presented in this document is a revision of the recommendations, based on the comments elicited by these consultations and on those of the Statistical Commission and the Population Commission.[1]

Concepts underlying the Principles

4. The Principles set forth in this document are not regulations or mandatory requirements, binding on nations. Rather, they are intended to set forth the elements which should be considered in the evaluation of any vital registration and statistics system. They are guiding principles which, when adapted to special conditions in each country, should result in more comparable and useful vital statistics.[2]

5. For convenience in reference, the Principles are grouped into four categories and serially numbered within each part, as follows:

Part 1. General principles (101-109);

Part 2. Principles for legal registration of vital events in so far as they relate to vital statistics (201-216);

Part 3. Principles for the recording, reporting, and collecting of data for statistical purposes (301-309);

Part 4. Principles for compilation of vital statistics (401-412).

6. It is recognized that the vital statistics system depends upon administrative and legal arrangements, many of which are matters of purely national concern. Therefore, the "Principles for registration" (part 2) do not cover all registration practice. They deal only with those registration aspects which have a bearing on the statistical report in terms of its content or its collection (and hence with the comparability of resulting statistics) and not with the legal connotations.

7. The Principles are in accord with previous international recommendations wherever they are applicable. Specifically, it may be noted that the recommendations relating to the responsibility for medical certification of cause of death, that referring to the use of the "International Form of Medical Certificate of Cause of Death", as well as the definition and classification of cause of death are in accordance with the World Health Organization Regulations No. 1 Regarding Nomenclature (Including the Compilation and Publication of Statistics) with Respect to Diseases and Causes of Death. The definitions of "live birth" and "foetal death" are those adopted by the Third World Health Assembly.

8. The definitions of "industry", "occupation", "status", "literacy", and "level of education" are in accordance with "Recommendations Regarding Subjects Which Should be Covered by Censuses of Population Taken in or Around 1950", made by the Population Commission of the United Nations at its third session, while the definition of "marital status" and certain of the age classifications shown in the tabulation programme of the Principles are in accordance with recommended "Tabulations of Data from Population

[1] For a complete history of the development of the Principles, see the reports of the 4th, 5th, 6th, and 7th sessions of the Statistical Commission and of the Population Commission, and "Proposed Standards for Vital Records and Statistics", E/CN.3/123—E/CN.9/65.

[2] Specific meanings attached to certain terms used in the Principles have been set forth in a glossary, beginning on page 228.

Censuses to be Taken in or About 1950", drawn up by the Population Commission at its fourth session.

9. It is emphasized also that the Principles which follow are not intended to spell out the detailed procedures of a vital statistics programme with respect to either registration, collection, or tabulation. Evaluation of methods and procedures for the implementation of the Principles, as well as their implications, will be made available in supplementary publications.

Applicability of Principles

10. These recommendations will be of value to countries now in process of organizing or reorganizing their vital statistics systems, as well as to countries appraising their systems with a view to improving the quality and comparability of their existing statistics.

11. The basic principles in parts 1-4 will be particularly applicable as guides to countries in which vital statistics are produced by a registration system of the conventional type and to those which, in developing vital statistics, contemplate the adoption of the traditional system. This nominal restriction of the principles is in recognition of the fact that the conventional method of obtaining vital statistics data from registration records is of limited applicability to statistically under-developed areas, and that, for these areas, alternative methods may have to be considered for a transitional or interim period.

12. It should be noted that neither these alternative methods nor the basic methods for the establishment of a registration system are dealt with in these Principles. Even in countries which have not as yet developed an adequate registration system, the Principles will serve as a goal for such future development and will be useful as a guide in their work of appraising and improving the quality and scope of demographic data.

Uses of vital statistics

13. The development of a system of vital statistics or the adoption of recommendations for improvement depend for their implementation on the recognition of the uses for the statistics concerned. The most important uses for vital statistics, as demonstrated by the experiences of many countries, are set forth in the following paragraphs.

14. The systematic recording of births and deaths was initially a procedure for establishing a record solely for its legal value. Recognition of the value of these records as a source of statistics developed much later as the potential uses of vital statistics as administrative and research tools became evident. One of the most important uses of vital statistics may be said to be their function in the demographic analysis of population for economic and social purposes. An analysis of the present demographic status of a population as well as its potential growth in terms of size, characteristics, geographic distribution, and health status, is of paramount importance in determining the economic and social life of a population, and must be based on a study of the natality, nuptiality, and mortality rates effective in that population.

15. Correlated with the general economic and social uses of vital statistics are the administrative and research needs of public health agencies in connexion with the development, planning, operation and evaluation of public health and medical programmes. Analysis of vital statistics with respect to the general and specific death rates is essential to the programmes of disease control. In addition to analytical uses, the public health authorities at the local level depend on the individual reports of the occurrences of specified events for initiating administrative action which will set in motion follow-up procedures essential to the maintenance of public health in the area.

16. Vital statistics are also employed for determining administrative action in connexion with the programme of governmental agencies other than those concerned with public health, and also in relation to numerous professional, private and commercial activities. Planning and production of public and private housing and educational facilities; planning and operating social security programmes and private insurance enterprises; production of consumer goods such as medicines, food, clothing, furniture, and equipment for infants and mothers, as well as household equipment in general; provision of medical care facilities for deliveries, services for interment, and so forth, are all dependent on information produced by the vital statistics system.

17. These needs, as well as the demands of the individual for documentary proof of an event and its characteristics, must all be met by the vital statistics system. To meet these needs adequately in all their ramifications, the system must operate according to certain well-defined principles which are applicable at every step beginning with the registration procedure and ending with the distribution of statistics.

PART 1

General principles (101-109)

101. Definition of a vital statistics system

For purposes of these Principles, a vital statistics system can be defined as including the legal registration, statistical recording and reporting of the occurrence of, and the collection, compilation, analysis, presentation, and distribution of statistics pertaining to "vital events", which in turn include live births, deaths, foetal deaths, marriages, divorces, adoptions, legitimations, recognitions, annulments, and legal separations.[3]

102. Function of the vital statistics system

(*a*) The development of vital statistics by the registration method is the function of the vital statistics system.

(*b*) The registration method is defined as the continuous and permanent, compulsory recording of the occurrence and the characteristics of vital events primarily for their value as legal documents as provided by law and secondarily for their usefulness as a source of statistics, as provided through decree or regulation, in accordance with legal requirements in each country.

[3] Other types of events of recognized demographic importance, such as migratory movements, naturalizations, and so forth, are not included in this definition because information on them is not usually collected through the regular civil registration system to which the Principles refer. Particular attention is drawn to the desirability of exploring methods for obtaining data on non-registered marital unions (variously known as "common-law", "customary" or "consensual") with recognition of the fact that, by their very characteristics, they are not obtained by the registration method as defined in Principle 102.

103. Confidentiality of registration records and statistical reports

Confidentiality of personal information on the registration records should be safeguarded by law in so far as consistent with its use for administrative and statistical purposes. The statistical reports should be open to the widest possible legitimate usage consistent with the needs for confidentiality in each country.

104. Designation of responsibilities for the vital statistics system

(*a*) Responsibility for the establishment or development of a national vital statistics system should be the function of a national governmental agency or agencies.

(*b*) The assignment of functions should be accompanied by clear designation of duties and responsibilities with respect to registration, recording, reporting, collection, compilation, analysis, presentation, and distribution of data, and the critical evaluation of the system.

105. Co-ordination between agencies with responsibilities in the vital statistics system

(*a*) Clear delineation of duties should be supplemented by arrangements for co-ordination of needs and services between official agencies concerned with the registration of events for legal purposes, those responsible for compiling facts for statistical purposes, and those who use these data for administrative or analytical purposes in connexion with economic and social matters, or for planning, operating, and evaluating public health programmes either on a national or an international scale.

(*b*) Co-ordination, especially with respect to coverage, definitions, classification schemes and tabulation programmes, should also be maintained with the authorities responsible for the population census or other types of population statistics, with those in charge of migration statistics, with the agencies responsible for public health statistics, and other related social and economic statistics.

(*c*) The co-ordinating mechanism established to achieve these objectives should have a direct relationship with the agency responsible for the general co-ordination of the national system of statistics.[4]

106. Critical evaluation of the vital statistics system

(*a*) As a supplement to co-ordination, responsibility for the establishment and execution of methods for critical evaluation of the vital statistics system should be vested in a designated authority.

(*b*) The elements of the evaluation programmes will vary in detail according to the degree of development of the system, but should include at some stage intensive studies of the degree of completeness of registration and of statistical reporting of events, with a view to evaluating the quantitative accuracy of vital statistics; analysis of the completeness and accuracy with which items of information relating to an event are recorded; determination of the success with which the tabulation programme meets the needs of consumers in terms of timeliness, adequacy and quality of statistics, and the general efficiency with which the system operates.

107. Place of sampling in the vital statistics system

The place of sampling in vital statistics procedures should be explored with a view to determining its applicability to quality control throughout the system, and to special surveys. It is evident that sampling is not applicable to legal registration, because every vital event which occurs among the population should be registered for legal purposes. However, where a complete registration system is not practicable or sufficiently reliable, the possibility of applying sampling methods to the reporting, collection and compilation phases should be explored, keeping in mind its limitations in providing the desired detail, and the requirement that sampling be carried out only under rigorous scientific specifications.

108. Place of special surveys in the vital statistics system

The value of special or census surveys in conjunction with the conventional system of vital statistics should be recognized as a means of gathering facts which cannot be collected so efficiently by routine comprehensive statistical reporting, or those which are required only at such widely separated intervals of time that it is inadvisable to include them as regularly reportable items of information for statistical purposes.

109. Place of record linkage (population registers) in the vital statistics system

The value of interrelating or linking vital records and of integrating these with census records in a continuous register system of population accounting is recognized, but establishment of such population registers should be contingent upon an evaluation of the statistical advantages to be derived in relation to cost and to the associated administrative purposes such a system would serve.

PART 2

Principles for legal registration of vital events in so far as they relate to vital statistics (201-216)

201. Vital events on which data should be collected by the registration method

(*a*) In general the vital events on which data should be collected by the registration method are those defined as constituting the field of vital statistics, i.e., live births, deaths, foetal deaths, marriages, divorces, adoptions, legitimations, recognitions, annulments, and legal separations, and which are defined for statistical purposes in Principle 202 below.

(*b*) In establishing or developing a vital statistics system, first priority should be given to setting up procedures for the registration and reporting of live births and deaths.

(*c*) Provision for registration of foetal deaths, marriages, and divorces should have secondary priority. With respect to foetal deaths, it may further be noted that, although the registration of all foetal deaths irrespective of the period of gestation is a desirable goal to be attained as soon as possible, as a minimum all countries should register all foetal deaths occurring after the 28th completed week of gestation.

[4] In some countries it has been found that co-ordination as recommended in this Principle has been facilitated through the establishment of "National Committees on Vital and Health Statistics" (of which the Statistical Commission took note at its fifth session) or committees or councils of a similar character.

(*d*) Arrangements for registration of adoptions, legitimations, recognitions, annulments, and legal separations should have a lower priority but represent an ultimate registration goal.

202. Definition for statistical purposes of each event on which data may be collected by the registration method

(*a*) The definition of each event on which data are collected for vital statistics purposes should conform, in so far as possible, with the definitions for statistical purposes given in paragraph (*c*) below.

(*b*) If a legal concept or definition in any country cannot be harmonized with these, provision should be made to report the events as defined below or in accordance with definitions which do not differ in principle from those below. If this is impossible, full description of divergencies should be given wherever statistics of these events appear.

(*c*) The recommended statistical definitions are as follows:

(1) LIVE BIRTH is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered live-born.

All live-born infants should be registered and counted as such irrespective of the period of gestation or whether alive or dead at time of registration, and if they die at any time following birth they should also be registered and counted as deaths.

(2) DEATH is the permanent disappearance of all evidence of life at any time after live birth has taken place (post-natal cessation of vital functions without capability of resuscitation). This definition therefore excludes foetal deaths.

(3) FOETAL DEATH is death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy; the death is indicated by the fact that after such separation the foetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles.

(4) STILLBIRTH is defined as synonymous with late foetal death, that is, one of twenty-eight completed weeks of gestation or over, subject to considerations mentioned in the footnote to this definition.[5]

(5) MARRIAGE is the legal union of persons of opposite sex. The legality of the union may be established by civil, religious, or other means as recognized by the laws of each country; and irrespective of the type of marriage, each should be reported for vital statistics purposes.

[5] Countries which prefer to continue to use the term "stillbirth" in statistical publications instead of the term "foetal death" should, in such publications, define stillbirths as early, intermediate, and late foetal deaths, as the case may be. The Statistical Commission has in mind the possibility that the use of the term "foetal death" in statistical publications may cause confusion in some cases and may lead to impairment of the clear distinctions at present drawn in recording and compiling statistics of live births and deaths.

(6) DIVORCE is a final legal dissolution of a marriage, that is, the separation of husband and wife by a judicial decree which confers on the parties the right to civil and/or religious remarriage, according to the laws of each country.

(7) ADOPTION is the legal and voluntary taking and treating of the child of other parents as one's own, in so far as provided by the laws of each country. ("Affiliation" is considered a type of adoption.)

(8) LEGITIMATION is the formal investing of a person with the status and rights of legitimacy, according to the laws of each country.

(9) RECOGNITION is the legal acknowledgment, either voluntarily or compulsorily, of the paternity of an illegitimate child.

(10) ANNULMENT is the invalidation or voiding of a marriage by a competent authority, according to the laws of each country, which confers on the parties the status of never having been married to each other.

(11) LEGAL SEPARATION is the disunion of married persons, according to the laws of each country, which does not confer on the parties the right to remarry.

203. Compulsory nature of registration

(*a*) In accordance with priorities established under Principle 201, registration of every vital event occurring within the boundaries of the country should be made legally compulsory for every group of the population and parallel provision for enforcement should be established.

(*b*) Supplementary arrangements on a non-compulsory basis for registration of events among national residents who are temporarily abroad may be provided at the national level.

(*c*) The efficiency with which these provisions operate or may be presumed to operate should not be a factor in their establishment.

204. Incentives to registration

Incentives should be established to stimulate and encourage compliance with the compulsory registration law.

205. Organization for registration at local and national level

(*a*) When the administrative and geographic organization of the country permits, responsibility for effecting the legal registration of vital events should be placed on official local agencies which are directly dependent, in so far as registration matters are concerned, on a national office which can co-ordinate, unify, supervise, and promote registration efficiency to the end that it satisfies both legal and statistical needs.

(*b*) In case direct dependence from the national level is not possible, the appropriate national office should have the functions of co-ordination.

206. Number and size of primary registration units

(*a*) Local registration offices should be established in adequate numbers and in such locations as will ensure that they are easily accessible to the public, and they should be kept open for business during convenient hours, so that the informant may comply with the registration requirements within the time allowed for current registration.

(*b*) The size of the primary registration unit should be such that the registrar in charge can give to that unit the attention required to produce good registration.

207. The registrar—his duties and responsibilities with respect to registration

(*a*) The duties and responsibilities of the registrar (or his equivalent) at the local, intermediate, and national levels should be codified.

(*b*) The responsibilities of the registrar should include, as appropriate, the legal recording of the specified information regarding vital events; the responsibility for ensuring compliance with the registration law; the responsibility for the accuracy and completeness of each record; the obligation to adopt such measures as are required to inform the public of the necessity, procedures, and requirements for effecting registration, and the value of vital statistics; the custody of records; and the recording and reporting of data for statistical purposes.

(*c*) The position of "registrar" should be one of local prestige and responsibility with remuneration sufficient to attract competent personnel.

208. Improving the efficiency of registrars

The national registration authority or its equivalent should take such steps as are necessary to provide guidance and instruction for registrars in the carrying out of their responsibilities.

209. Designation of legally responsible informant

(*a*) Responsibilities with respect to informing the registration authorities of the occurrence of an event should be clearly and unequivocably designated by law or regulation, and publicized in such a way that familiarity with the legal obligations is established.

(*b*) Provision should be made for delegation of authority in certain circumstances as required by questions of literacy, topography, place where event occurs, and so forth.

(*c*) As far as possible, medical certification of cause of death should be the responsibility of the attending physician.

210. Place where registration is to be made

(*a*) Each vital event should be registered in the primary registration unit in which it occurred.

(*b*) The place of residence should always be reported (see Principle 409) and if the registered event concerns a resident of a locality other than that where the event occurred, it may be desirable also to make such arrangements as are required to inform the place of residence of the event.

211. Cost of current registration

(*a*) The registration of vital events, as prescribed by law, should be free of charge to the person making the registration if provisions of the law with respect to time and so forth are complied with.

(*b*) As an incentive to registration, it may be desirable in some countries to furnish an initial proof of registration to the informant, without charge.

212. Time allowed for current registration

The maximum period to be allowed between the occurrence and the obligatory registration of a vital event should be determined with respect to all the contributory factors operating in the country and should be as short as is consistent with the facilitating of the current and accurate registration of all necessary facts.

213. Provision for delayed registration

(*a*) Every vital statistics system should recognize the inevitability of delayed or late registration, i.e., those registrations which can be effected through regular registration procedures but which are made after the expiration of the standard registration period.

(*b*) Provision should be made for registering these events in a way which will discourage repetition, but not discourage registration.

214. Provision for registration of "declared events"

(*a*) Every vital registration system should recognize the inevitability of the need for registering "declared events", such as live births or legally presumed deaths which occurred more than 12 months prior to the current month and/or under such circumstances that the conventional procedures and requirements for registration cannot be met.

(*b*) Provision should be made to register these declared events upon declaration, which may be made subject to an appropriate fee and substantiation by judicial procedures, documentary evidence and/or affidavits, the type and extent of which to be determined by each country.

215. Form and content of the registration record

(*a*) Separate registers should be maintained for each type of event on which data are to be collected by the registration method.

(*b*) In order to ensure uniformity throughout the country, the form and content of the registration record should conform in basic context to a national standard established by the national agency which controls or co-ordinates registration. Such standardization should not, of course, prejudice the right of sub-national authorities to add important items of local interest or administrative value.

(*c*) When the registration record is the original and only source of information for statistical purposes, provision should be made for obtaining the items listed in Principle 308 (*d*).

216. Definition of each item on the registration record

(*a*) Each item on the registration record should be defined, clearly and unambiguously, in accordance with international standards, national population census practice and vital statistics requirements.

(*b*) The designated definitions should be printed either on the registration record itself or in the form of separate instructions, in order that they may be available at all times to the registrar responsible for interpreting them.

PART 3

Principles for the recording, reporting, and collecting of data for statistical purposes (301-309)

301. Statistical reporting—coverage

A statistical report should be made on every event which is legally registered whether registration takes place within the period prescribed for current registration or is delayed, and irrespective of the procedure by which the legal record is established, that is, whether by regular procedures or as a "declared event" (see Principles 213 and 214).

302. Statistical reporting area—geographic and ethnic aspects

(*a*) No geographic area or ethnic group for which registration records are available should be excluded from the statistical reporting area, and emphasis should be placed on statistical recording and reporting of all events which occur, irrespective of the completeness of registration coverage or the extent of data available.

(*b*) As far as practicable, qualitative or quantitative indications of the degree of completeness of registration should be given for each geographic reporting area.

303. Organization for collection of statistical reports

(*a*) Reports on vital events for national statistical purposes should be collected centrally by the agency which is responsible for the statistical compilation.

(*b*) If it is desirable for sub-national purposes, provision should be made for channelling original statistical reports through, or supplying copies thereof to, local, state or provincial departments of government which may require information on individual reports for statistical or other purposes.

304. Control of receipt of statistical reports

(*a*) Every possible administrative procedure should be employed for controlling the prompt receipt, by the central vital statistical office, of statistical reports from every reporting area, with the object of making possible current tabulations which will be adequate in terms of completeness of geographic and ethnic coverage, timeliness and detail. (See also Principle 401.)

(*b*) A strict time schedule should be established, taking into account the characteristics of the country in terms of topography, communications, and so forth, as well as the provisions for channelling original reports or copies thereof to intermediate offices.

305. The registrar—his duties and responsibilities with respect to recording and reporting statistical information

(*a*) The legal definition of the responsibilities of the registrar should specify that he has duties with respect to recording and reporting information for statistical purposes in addition to his responsibilities for filing legal records of events.

(*b*) Whether the specified procedure provides that he transmit to the statistical authorities a duplicate of the original legal record or an independent statistical form (see Principle 307 below), this report should be as complete and accurate as he can make it and the coverage in terms of events occurred should also be complete and timely.

306. Improvement of completeness and accuracy of data reported for statistical purposes

(*a*) An appropriate continuous querying procedure should be established and maintained with respect to all data which are collected for statistical purposes — and in particular with respect to terms of doubtful significance used in reporting causes of death — with the purpose of clarifying the facts concerning the event and of educating the informant and the recording agent regarding reporting requirements, in order that the resulting statistics may be improved.

(*b*) Methods to improve basic data by means of continuous training and instruction of registrars and of medical personnel should be an essential part of an effective vital statistics system.

307. Form of the statistical report on a vital event

(*a*) The form of the statistical report on a vital event should be uniform throughout a country.

(*b*) For purposes of flexibility and efficiency, the report should be an individual document which provides adequate space for the response to each item of information required.

(*c*) With respect to medical certification of cause of death, it is suggested that the form adopted should conform as far as possible to the "International Form of Medical Certificate of Cause of Death".[6]

308. Content of the statistical report on a vital event

(*a*) To satisfy national and international needs for vital statistics, the statistical reports of vital events for all countries should contain, as a minimum, a number of basic items and such additional items as may be desirable and practicable in each country.

(*b*) A list of basic items for reports of live birth, death, foetal death, marriage, and divorce is given in paragraph (*d*) below. This suggested list is neither a minimum nor a maximum, but a desirable list of items. Each country should consider the scientific value of collecting information on other items which would permit additional analyses of demographic factors in relation to significant social and economic groups within the country. Items of this character which, because of their local rather than universal applicability, are not specified in list (*d*), might include "ethnic group", "country of birth", "nationality", "citizenship", "religion", "language", or additional information on economic characteristics. (See also Principle 403 (*c*).)

(*c*) The exact manner in which the specified items will be set forth on the statistical reports will be determined by each country, but the wording should be such that the results will conform to the definitions given in Principle 309.

(*d*) Items suggested for each of five statistical reports are given below, arranged in alphabetical order by event and participants, with an indication of first (*) and second priority rating. Some countries at the early stages in the development of their vital statistics systems may wish to subdivide the first priority group in order to establish immediate and more advanced goals.

(1) Live-birth statistical report items

(i) *Characteristics of the event or child*
- *Attendant at birth
- *Date of occurrence
- *Date of registration
- Hospitalization
- *Legitimacy
- Period of gestation
- *Place of occurrence
- *Sex
- *Type of birth, i.e., single or plural issue
- Weight at birth

(ii) *Characteristics of parents*
- Date of birth of father; if not available, age

[6] Published in "Medical Certification of Cause of Death. Instructions for Physicians on Use of International Form of Medical Certificate of Cause of Death" (*Bulletin of the World Health Organization: Supplement 3*, Geneva, Switzerland, 1952, p. 7).

*Date of birth of mother; if not available, age
Date of marriage (for legitimate births)
Industry
Literacy or level of formal education
*Number of children born to this mother
Occupation
*Place of usual residence (of mother)
Status (as employer, employee, etc.)

(2) Death statistical report items

(i) *Characteristics of event*
*Cause of death
*Certifier
*Date of occurrence
*Date of registration
*Place of occurrence

(ii) *Characteristics of decedent*
Age of surviving spouse (for married)
*Date of birth; if not available, age
Hospitalization
Industry
Legitimacy (for under one year of age)
Literacy or level of formal education
Marital status
Number of children born (for females of child-bearing age or over)
Occupation
*Place of usual residence
*Sex
Status (as employer, employee, etc.)

(3) Foetal-death statistical report items

(i) *Characteristics of event or product*
Cause of foetal death
Certifier or attendant
*Date of occurrence (of foetal delivery)
*Date of registration
Hospitalization
*Legitimacy
*Period of gestation
*Place of occurrence
*Sex
*Type of birth, i.e., single or plural issue
Weight at delivery

(ii) *Characteristics of parents*
Date of birth of father; if not available, age
*Date of birth of mother; if not available, age
Date of marriage (for legitimate pregnancies)
Industry
Literacy or level of formal education
*Number of children born to this mother
Occupation
*Place of usual residence (of mother)
Status (as employer, employee, etc.)

(4) Marriage statistical report items

(i) *Characteristics of event*
*Date of occurrence
Date of registration
*Place of occurrence

(ii) *Characteristics of bride and groom*
*Date of birth; if not available, age
Industry
Literacy or level of formal education
*Marital status
Number of previous marriages
Occupation
*Place of usual residence
Status (as employer, employee, etc.)

(5) Divorce statistical report items

(i) *Characteristics of event*
*Date of occurrence
Date of registration
*Place of occurrence

(ii) *Characteristics of divorcees*
*Date of birth; if not available, age
*Date of marriage
Industry
Literacy or level of formal education
*Number of dependent children
Number of previous marriages
Occupation
Place of occurrence of marriage
*Place of usual residence
Status (as employer, employee, etc.)

309. Definition of each item on the statistical report

(*a*) Each item on the statistical report should be accompanied by a clear, explicit, and simple definition for the guidance of the person recording the information.

(*b*) In order to achieve international comparability, definitions adopted should be in accordance with established international standards and, in so far as possible, with current population census practice in each country.

(*c*) Definitions which may operate to improve international comparability in connexion with the items suggested for inclusion in the statistical reports (Principle 308) are given below. Except where otherwise indicated, the characteristics should be reported as of the date of occurrence of the event.

(1) AGE (duration of life at death, at birth of child, at delivery of foetus, at marriage, at divorce) is the estimated or calculated interval between the date of birth and the date of occurrence of the event, expressed in the largest possible completed units of time, such as years, months, weeks, days or hours of life, as appropriate.

(2) ATTENDANT AT BIRTH is the physician, midwife, nurse, or other person who delivered the mother.

(3) BIRTH ORDER is a tabulation concept based on item (19), "Number of children born to this mother". For definitions, see Principle 410 (*e*) (5) and (20).

(4) CAUSE OF DEATH is the morbid condition or disease process, abnormality, injury or poisoning leading directly, or indirectly, to death. Symptoms or modes of dying such as heart failure, asthenia, etc., are not considered to be causes of death for statistical purposes. The *underlying cause of death,* which, rather than the direct or intermediate antecedent cause, is the one to be adopted as the main cause for tabulation of mortality statistics may be defined as (*a*) the disease or injury which initiated the train of morbid events leading directly to death, or (*b*) the circumstances of the accident or violence which produced the fatal injury.

(5) CERTIFIER is the person who certified the cause of death, i.e., the physician or surgeon who attended, the medical practitioner who examined the body, or the coroner, midwife, nurse, or layman who reported the cause.

(6) DATE OF BIRTH (of parents, of deceased, of bride and groom, of divorcees) should be expressed as year, month, and day of birth, that is, in detail equivalent to that given for "date of occurrence of event" in order that exact interval between the two dates may be determined in completed years, months, weeks, days, or hours of life, as required. If it is not possible to establish date of birth, give "age" as defined in (1) above.

(7) DATE OF MARRIAGE in connexion with legitimate births is the day, month, and year of the marriage of the parents of the child or foetus. For marriages being dissolved by divorce, it is the day, month, and year of the current marriage.

(8) DATE OF OCCURRENCE (of live birth, death, delivery of dead foetus, marriage or divorce) is the exact date when the event occurred, and should be expressed in terms of day, month, and year, and hour if appropriate.

(9) DATE OF REGISTRATION (of live birth, death, foetal death, marriage, or divorce) should be expressed as day, month, and year when the legal registration was made.

(10) DURATION OF MARRIAGE is a tabulation concept based on "date of marriage", item (7). For definition see Principle 410 (*e*) (28) and (29).

(11) HOSPITALIZATION refers to the actual place where the event occurred, as for example in a hospital, institution, private home, or other location.

(12) INDUSTRY (branch of economic activity) refers to the activity of the establishment in which an individual is employed, or the kind of business he operates. The time reference of the industry to be reported on vital records, as well as the treatment of persons who have never worked or who are retired, should be consistent with procedures adopted for population census purposes. (See also "Occupation", item (22) and "Status", item (26).)

(13) LEGITIMACY is the status of the child or dead foetus with respect to being legitimate, that is, considered as the lawful issue of a couple.

(14) LEVEL OF FORMAL EDUCATION should aim to show the highest level of instruction to which the individual has attained in the country's regular educational system or its equivalent. If this information is confined to the population above a stated minimum age, the minimum should not be higher than twenty-five years. (See also "Literacy", item (15).)

(15) LITERACY is defined for purposes of international comparisons as ability both to read and to write a simple message in any one language. If this question is confined to the population above a stated minimum age, the minimum should not be higher than fifteen years. (See also "Level of formal education", item (14).)

(16) LIVE-BIRTH ORDER is a tabulation concept based on "Number of children born to this mother", item (19). For definition, see Principle 410 (*e*) (5).

(17) MARITAL STATUS should be expressed in such categories as are required for national purposes but in a manner which will be in conformity with the following concepts as applied to the event being reported: married; in stable *de facto* unions (consensually married); widowed, not remarried; divorced, not remarried; single — that is, not married, widowed, or divorced in the sense stated above. Should it be impossible to obtain information on consensual unions separately, they should be recorded as "married".

(18) MARRIAGE BIRTH ORDER is a tabulation concept based on "Number of children born to this mother", item (19). For definitions, see Principle 410 (*e*) (5) and (20).

(19) NUMBER OF CHILDREN BORN TO THIS MOTHER is defined as "total issue", that is, all children (*including this one* in the case of the live-birth or foetal-death report) born alive or born dead during the lifetime of this mother, and expressed in such a way as to distinguish (*a*) children now living, (*b*) children born alive and now dead, and (*c*) children born dead. In the case of plural issue, each child or foetus resulting from a confinement should be counted separately. For legitimate births, provision may be made to obtain information on how many children in (*a*), (*b*), and (*c*) above were issue of the current and, in some instances, of the previous marriages. If the distinction between (*a*), (*b*) and (*c*) above is not practicable, the country should endeavour to obtain information on "total live births to the mother", or nearest approximation.

(20) NUMBER OF DEPENDENT CHILDREN is the total number of living children under 16 years of age dependent on either of the divorcees at the time the petition is filed.

(21) NUMBER OF PREVIOUS MARRIAGES (of persons marrying or of divorcees) is the number of marriages entered into *before* the one contracted at this marriage, or *before* the one ending in this divorce, irrespective of whether the last previous marriage was dissolved by death or divorce.

(22) OCCUPATION is the trade, profession, or type of work performed by the individual. For vital records, the time reference and treatment of retired and prelabour force individuals should correspond, as in the case of "industry", with the concept adopted for the census of population. (See also "Industry", item (12) and "Status", item (26).)

(23) PERIOD OF GESTATION is the number of completed weeks which have elapsed between the first day of the last menstrual period and the date of delivery, irrespective of whether the product of conception was live-born or born without evidence of life.

(24) PLACE OF OCCURRENCE is the geographic locality where the birth, death, delivery of a dead foetus, marriage, or divorce occurred. This information should be given in enough detail to enable tabulations to be made for at least the largest administrative subdivisions of the country and for such smaller administrative subdivisions as may be required for national use.

(25) PLACE OF USUAL RESIDENCE is the geographic locality where the person concerned with the vital event usually lives. This information should be given in enough detail to enable tabulations to be made for at least the largest administrative subdivisions of the country and for such smaller administrative subdivisions as may be required for national use. (Method of determining "place of residence" for purposes of tabulation is given in Principle 409 (*b*).)

(26) STATUS (as employer, employee, etc.) refers to the status of an individual with respect to his employ-

ment, that is, whether he is an employer, worker on own account, employee, or unpaid family worker. (See also "Industry", item (12) and "Occupation", item (22).)

(27) TOTAL BIRTH ORDER is a tabulation concept based on "Number of children born to this mother", item (19.) For definitions, see Principle 410 (*e*) (20).

(28) TYPE OF BIRTH refers to the single or plural nature of the issue of the pregnancy to which the statistical report relates. Each live-born infant or dead foetus should be characterized as single, twin, triplet, and so forth, and, for each member of a plural birth, provision should be made to indicate the condition of the other member(s) (mates) with respect to being born alive or dead (foetal death), and, if desired, sex.

(29) TYPE OF CERTIFICATION is a tabulation concept based on the identity of the certifier, item (5) above. (See also Principle 410 (*e*) (11).)

(30) UNDERLYING CAUSE OF DEATH — see "Cause of death", item (4).

(31) WEIGHT of a live-born child at birth or of a dead-born foetus at delivery should be the weight determined immediately after delivery, and should be expressed in grammes to a degree of significance which will allow a classification of 500-gramme intervals to be made.

PART 4

Principles for compilation of vital statistics (401-412)

401. Goal of the compilation programme

The compilation of vital statistics should have as its minimum general goal (1) the provision of total monthly or quarterly summary counts of live births and deaths (and of foetal deaths, marriages and divorces if these are included in the collection programme) on a time schedule prompt enough to provide information for administrative or other needs; and (2) the production of detailed annual tabulations of such type and on such time schedule as will make possible their effective use for the scientific analysis of the interrelationship between demographic, economic and social factors, for planning, operating, and evaluating public health programmes, and for other purposes as required. In so far as possible, such statistics should be comparable on an international basis and lend themselves to international analysis.

402. Tabulation area[7]—geographic aspect

(*a*) In accordance with individual national conditions and needs, specific standards for completeness of registration and data coverage should be set up, and every effort should be made to ensure that the data for the entire national territory meet these standards.

(*b*) Where it is impossible to secure figures for the entire national territory which meet the predetermined degree of completeness with respect to registration and data coverage, detailed tabulations should be made only for data from geographic areas which meet the specified conditions. Separate but regular tabulations should be made for data from areas falling below the determined criteria, and efforts should be made to improve registration in the sub-standard areas with a view to including them as soon as possible in the "national tabulation area".

(*c*) In such cases where the national tabulation area is less than the national territory, special care should be taken to explain limitations of coverage and the implications thereof wherever the statistics appear.

403. Tabulation coverage—ethnic aspect

(*a*) Every effort should be made to ensure that national vital statistics refer to the total population of the country.

(*b*) Where registration of vital events among important population groups is very incomplete and/or the quantity or quality of original data is very deficient, separate tabulations may have to be made for the various segments of the population and an explanation of the limitations in coverage given wherever the statistics appear.

(*c*) In countries where the social and economic characteristics of large segments of the population vary greatly, it is recommended that, in so far as possible, the identity of each important population group be maintained in the tabulations. (See also Principle 308 (*b*).)

404. Organization for compilation of national vital statistics

National vital statistics should be compiled on a centralized basis by a national agency specifically charged with this statistical function.

405. National compilation from individual statistical reports

(*a*) National vital statistics should be compiled in such a way as to obtain uniformity of classification and tabulation and to permit flexibility and adaptability in tabulation to meet national and international requirements.

(*b*) Experience has shown that the procedure best adapted to produce the highest degree of accuracy, uniformity, and flexibility is centralized compilation from individual reports which contain full information necessary for statistical purposes. (See also Principle 404 above).

406. Tabulation coverage—"cut-off date"

(*a*) Final annual tabulations should be made on the basis of statistical reports received before a specified date known as a "cut-off date", determined by each country on the basis of national factors such as the period allowed for registration and the channels for statistical reporting.

(*b*) Reports received after the cut-off date, which will include reports on events which have been registered by any means at varying times after the expiration of the legal maximum declaration period, should be tabulated separately by date of occurrence in order that they may provide a means by which analysis of the problem of delayed registration, declared registration, and delayed reporting may be made with a view to initiating appropriate remedial measures, if required. Unless the volume is very large, extensive detailed national tabulations would not ordinarily be made on these reports.

407. Tabulation by calendar periods

Final tabulations should refer to a Gregorian calendar period, i.e., solar month, quarter, or year, as ap-

[7] "Tabulation area" is used to represent that geographic area which meets certain national criteria for completeness of registration and data coverage, and on which, therefore, national tabulations are based.

propriate. If for reasons of climate or other considerations national vital statistics are more meaningful on a different time base, provision should be made for supplying solar calendar-period tabulations in addition.

408. Tabulation by date of occurrence or date of registration

(*a*) Final tabulations for any calendar period should be based on events which occurred during that period and not on those registered. Should it be administratively necessary to tabulate final figures by "date of registration" rather than "date of occurrence", evaluation studies should be made to determine the degree to which tabulations by date of registration approximate those by date of occurrence, and it is desirable that the analyses of this relationship be published.

(*b*) For purposes of current weekly, monthly, or quarterly summaries which must be compiled rapidly, counts referring to date of registration may be used but in this case also it should be demonstrated that analyses based on events which are registered during a period can be interpreted in terms of those which occurred.

409. Tabulation by place of occurrence and place of residence

(*a*) Final tabulations for geographic areas less than the total national territory and for cities, should be made according to place of usual residence. In addition, such place-of-occurrence tabulations as are required for administrative or other purposes should be made.

(*b*) Determination of "place of residence"[8] for purposes of tabulation should be made as follows:

Live births, Foetal deaths, Infant deaths	Place of residence of mother
Deaths	Place of residence of decedent
Marriages	Place of residence of groom
Divorces	Place of residence of husband

(c) Tabulation of data for the national territory should relate in general to data on events occurring within the national boundaries, although under certain circumstances, as for example during war years, provision may need to be made for including in the national tabulations data for deaths among the armed forces stationed outside the national boundaries.

(*d*) Special consideration should be given to obtaining corresponding population figures for the computation of rates.

410. Annual tabulation programme for national and international purposes

(*a*) The annual tabulation programme for national and international purposes should provide data in such classifications as are required for national study of the incidence, time trends and geographical differentials of the most important characteristics of fertility, mortality, nuptiality, and divorce, and the exploration of their interrelationships. It should also seek to meet the requirements of international agencies and, in general, be in agreement with the recommendations for achieving international comparability.

(*b*) The design of the tabulation programme should take into consideration the maximum utilization of information available, the desirability of the tabulations, the practicability of performing the counting operations, using the tabulation facilities ordinarily available to the statistical services of the countries, and the suitability of the arrangement for deriving tables for presentation.

(*c*) A suggested basic annual programme for the tabulation of live births, deaths, foetal deaths, marriages and divorces, including suggested standard classification schemes, is given in paragraph (*e*) below. This programme, which makes use of only the first priority (*) items in Principle 308, consists of tabulations which are of major general importance for purposes of demographic analysis. However, it should not be overlooked that vital statistics of a country are more useful to that country and for general scientific purposes if they are tabulated in relation to the significant social and economic groups which are identified within the country (see Principle 403). The basic tabulation programme in paragraph (*e*) does not include such tabulations, and many countries will wish to compile their vital statistics also in relation to other variables given in paragraphs (*b*) and (*d*) of Principle 308 and by "urban-rural" groupings or for localities classified by size, etc.

(*d*) It is emphasized that the tabulations outlined below do not constitute a working programme of operating specifications. The manner in which these data are to be obtained from the tabulations will vary according to the types of equipment available. Hence, in designing operating specifications, these suggested tabulations of data will need to be combined in such a way as to obtain the maximum utilization of equipment at hand. Neither are the suggested tabulations a publication programme because it may not be desirable to publish annually all of the classifications indicated below, or it may be inexpedient to publish the data in these forms. Therefore, these tabulations represent only the cross-classifications and counts which are considered desirable for an annual programme in each country.

(*e*) An annual tabulation programme based on the first priority (*) statistical items listed in Principle 308 and defined in Principle 309 is given in this paragraph. Unless otherwise specified and as applicable, it is suggested that the tabulations outlined below be made for the following geographic areas: (1) the country as a whole; (2) each major civil division; and (3) each very important city. "Residence" is determined as set forth in Principle 409.

(1) **Live births classified by place of occurrence**
(Tabulate also for each geographic unit smaller than the major civil division.)
Classification
Place of occurrence: each major civil division, each geographic unit smaller than the major civil division, each very important city in the country.

(2) **Resident live births classified by attendant at birth**
(Tabulate also for each geographic unit smaller than the major civil division.)
Classification
Attendant: physician, midwife, nurse, other, not stated.

(3) **Resident live births classified by month of occurrence**
Classification
Month of occurrence: calendar month.

[8] The definition of "residence" upon which the allocation of vital events to place of residence is made should not be a legalistic one but one which will allow vital statistics to be related to corresponding population data.

(4) **Resident live births cross-classified by sex and legitimacy**
Classifications
Sex: male, female.
Legitimacy: legitimate, illegitimate, not stated.

(5) **Resident live births cross-classified by age of mother and live-birth order**[9]
Classifications
Age: under 15 years, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and over, not stated.
Live-birth order: 1st, 2nd, 3rd, 4th . . . 10th and over, not stated.

(6) **Deaths classified by place of occurrence**
(Tabulate also for each geographic unit smaller than the major civil division.)
Classification
Place of occurrence: each major civil division, each geographic unit smaller than the major civil division, each very important city in the country.

(7) **Deaths classified by place of residence of decedent**
(Tabulate also for each geographic unit smaller than the major civil division.)
Classification
Place of residence: each major civil division, each geographic unit smaller than the major civil division, each very important city in the country.

(8) **Resident deaths cross-classified by month of occurrence and selected causes of death**
Classifications
Month of occurrence: calendar month.
Causes of death: selected underlying causes.[10]

(9) **Deaths cross-classified by sex, age, and cause**
(Tabulate only for the *country* as a whole.)
Classifications
Sex: male, female.
Age: under 1 year, 1, 2, 3, 4, 5-9, 10-14, 15-19, 20-24, 25-29 . . . 85 and over, not stated.
Cause of death: Intermediate List of 150 Causes.[11]

(10) **Resident deaths cross-classified by sex, age and cause**
Classifications
Sex: male, female.
Age: under 1 year, 1-4, 5-14, 15-24, 25-34 . . . 65-74, 75 and over, not stated.
Cause: Abbreviated List of 50 Causes.[12]

(11) **Resident deaths cross-classified by type of certification and cause**
Classifications
Type of certification:[13] medical, other, not stated.
Cause: Intermediate List of 150 Causes.[11]

(12) **Infant deaths (under 1 year of age) classified by place of occurrence**
(Tabulate also for each geographic unit smaller than the major civil division.)
Classification
Place of occurrence: each major civil division, each geographic unit smaller than the major civil division, each very important city in the country.

(13) **Infant deaths (under 1 year of age) classified by place of residence of mother**
(Tabulate also for each geographic unit smaller than the major civil division.)
Classification
Place of residence: each major civil division, each geographic unit smaller than the major civil division, each very important city in the country.

(14) **Resident infant deaths (under 1 year of age) cross-classified by age and month of occurrence**
Classifications
Age: under 28 days, under 1 year, not stated.
Month of occurrence: calendar month.

(15) **Resident infant deaths (under 1 year of age) cross-classified by sex and age**
Classifications
Sex: male, female.
Age: under 1 day, 1, 2, 3, 4, 5, 6 days; 7-13, 14-20, 21-27, 28 days to under 2 months; 2, 3, 4 . . . 11 months; not stated.

(16) **Resident infant deaths (under 1 year of age) classified by cause of death**
Classification
Causes of death: selected underlying causes.[14]

(17) **Foetal deaths classified by place of occurrence**
Classification
Place of occurrence: each major civil division, each very important city in the country.

(18) **Resident foetal deaths classified by sex and period of gestation**
Classification
Period of gestation: under 20 completed weeks, 20-27 completed weeks, 28-36 completed weeks, 37 completed weeks and over, not stated.

(19) **Resident late[15] foetal deaths cross-classified by sex and legitimacy**
Classifications
Sex: male, female, not stated.
Legitimacy: legitimate, illegitimate, not stated.

[9] Live-birth order is the numerical order of the child (the report of whose birth is being tabulated) in relation to all previous live-born issue of the mother, irrespective of whether pregnancies were nuptial or extra-nuptial. It is computed on the basis of information given under item (19) of Principle 309, that is, "Number of children born to this mother" (*a*) now living, and (*b*) born alive and now dead. Should it be desirable to compute live-birth order solely on nuptial or legitimate issue, it is suggested that the term "marriage live-birth order" be adopted for this modified index.

[10] Causes of death to be selected are those which are not only important to the country as leading causes of death but which also have significant seasonal variation. Categories should be selected from the "Detailed List" of the *Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death*. Sixth Revision of the International Lists of Diseases and Causes of Death, Adopted 1948, Volume 1. (Bulletin of the World Health Organization: Supplement 1, Geneva, Switzerland, 1948), pp. 1-42.

[11] *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death*. Op. cit., pp. 355-360.

[12] *Ibid.*, pp. 361-2.

[13] In order to give some indication of the specific type of medical certification, it is suggested that, if possible, a distinction be made between certification by the physician or surgeon who *attended* the deceased at the last illness and certification by a medical practitioner who only *examined* the body after death.

[14] Causes of death to be selected are those which are important as causes of infant mortality. Categories should be selected from the "Detailed List" of the *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death*, op. cit., pp. 1-42.

[15] "Late foetal deaths" refer to those of 28 completed weeks of gestation and over.

(20) **Resident late[15] foetal deaths cross-classified by age of mother and total birth order[16]**
Classifications
Age: under 15 years, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and over, not stated.
Total birth order: 1st, 2nd, 3rd, 4th . . . 10th and over, not stated.

(21) **Confinements[17] cross-classified by type of birth and status of issue with respect to being born alive or dead**
Classifications
Type of birth: single, twin, triplet, quadruplet, etc., and not stated.
Status of issue:
Single —live birth,
foetal death;
Twin —2 live births,
1 live birth and 1 foetal death,
2 foetal deaths;
Triplet—3 live births,
2 live births and 1 foetal death,
1 live birth and 2 foetal deaths,
3 foetal deaths;
and so forth.

(22) **Resident[18] marriages classified by month of occurrence**
Classification
Month of occurrence: calendar month.

(23) **Resident marriages cross-classified by age of bride and age of groom**
Classification
Age: under 15 years, 15-19, 20-24, 25-29 . . . 75 and over, not stated.

(24) **Resident marriages cross-classified by previous marital status of bride and previous marital status of groom**
Classification
Marital status: single, widowed, divorced (or equivalent). In addition, "married" for males if polygamy is allowed.

(25) **Marriages cross-classified by previous marital status and age of participants. Tabulate separately for bride and for groom**
(Tabulate only for the *country* as a whole.)
Classifications
Marital status: single, widowed, divorced (or equivalent). In addition, "married" for males if polygamy is allowed.
Age: under 15 years, 15-19, 20-24, 25-29 . . . 75 and over, not stated.

(26) **Divorces classified by place of occurrence**
Classification
Place of occurrence: each major civil division, each very important city in the country.

(27) **Resident divorces cross-classified by age of wife and age of husband**
Classification
Age: under 15 years, 15-19, 20-24, 25-29 . . . 75 and over, not stated.

(28) **Divorces cross-classified by duration of marriage[19] and age of divorcees. Tabulate separately for husband and for wife**
(Tabulate only for the *country* as a whole.)
Classifications
Age: under 15 years, 15-19, 20-24, 25-29 . . . 75 and over, not stated.
Duration of marriage: under 1 year, 1, 2, 3, 4, 5, 6, 7, 8, 9 years, 10-14, 15-19, 20 years and over, not stated.

(29) **Divorces cross-classified by number of dependent children and duration of marriage[19]**
(Tabulate only for the *country* as a whole.)
Classifications
Number of dependent children: none, 1 child, 2 children . . . 7 and over, not stated.
Duration of marriage: under 1 year, 1, 2, 3, 4, 5, 6, 7, 8, 9 years, 10-14, 15-19, 20 years and over, not stated.

411. Tabulations necessary for the administration of the vital registration system

In addition to the tabulations mentioned in Principle 410 (*e*), provision should be made to tabulate items which evaluate the efficiency of the registration system. Such tabulations would be utilized in the analysis of vital statistics and would serve as a guide for the improvement of services.

412. Provision of tabulations to meet local needs

(*a*) The national tabulation programme carried out by a national office of vital statistics may need to be supplemented by summary tabulations, made at the local or regional level by the services concerned, which would have as their objective the prompt provision of information on subjects requiring immediate administrative action.

(*b*) Provision should be made at the national level to provide, on request, detailed geographic tabulations which may not be included in the routine national tabulation programme.

Glossary of terms

Analysis (statistical) is the examination of data by the statistical method to distinguish the component parts or elements, to investigate their nature and relation to each other and to the whole, and to interpret these quantitative, causal, or probable relations in terms of the problem under study.

Assembling is the process of gathering or bringing together statistics compiled on a decentralized basis.

Classification is the systematic arrangement (sorting) of units into the established mutually exclusive categories or classes of a definite classification scheme, designed for a specific characteristic of the unit.

[16] "Total birth order" is the numerical order of the foetus (the report of whose death is being tabulated) in relation to all previous issue of the mother, irrespective of whether the issue were live-born or dead foetuses, or whether pregnancies were nuptial or extra-nuptial. It is computed on information given in item (19) of Principle 309, that is "Number of children born to this mother", or "total issue". Should it be desirable to restrict "total birth order" to nuptial or legitimate issue only, it is suggested that the term "marriage total birth order" be adopted for this modified index.

[17] "Confinements", as used here, is synonymous with "deliveries", "maternities", or "total cases of birth". The number of confinements is the same as the number of individuals (live-born or still-born) in the case of single births, but is of course less than the total number of live births plus foetal deaths in the case of plural issue, inasmuch as the term refers to the "sets" of twins or triplets.

[18] Tabulations should be made by residence of the bride as well as by residence of the groom.

[19] "Duration of marriage" is the time, in completed years, elapsed between the exact date of the marriage being dissolved and the date of the divorce.

Collection is the process of gathering individual reports on vital events for the purpose of compiling statistics from them.

Compilation is the process of condensation of information by classifying and tabulating statistical reports in various categories or classes with the object of producing vital statistics according to a predetermined programme.

Consolidation is the process of combining into one aggregate statistics compiled by different agents.

Distribution is the process of disseminating statistics among consumers, usually in the form of published documents.

Presentation is the making available of statistics, through publication or other means of dissemination.

Recording (statistical) is the inscription, for statistical purposes, of specified items of information with respect to a registered event.

Register (noun) is a collection, list, or file of records arranged according to some filing scheme.

Register (verb) — see "registration".

Registrar is the official authorized to register the occurrence of a vital event and to record the required details with respect to it.

Registration is the legal recording with the authorized officials of the occurrence of an event, together with certain identifying or descriptive characteristics of the event.

Registration method is the continuous and permanent, compulsory recording of the occurrence and the characteristics of vital events primarily for their value as legal documents and secondarily for their usefulness as a source of statistics.

Registration record is the legal document which attests to the occurrence and to certain characteristics of a vital event.

Registration statistics — see "vital statistics".

Report (statistical) is the record containing the items of information with respect to a vital event, that is, the "raw" materials systematically arranged, which are required for vital statistics.

Reporting (statistical) is the transmission of statistical reports on vital events to the agency responsible for compilation of statistics on these events.

Tabulation is the counting of units in each category of a specific classification scheme and the systematic arrangement (seriation) of the results in such tabular form as will serve the needs of the investigation.

Vital event is a live birth, death, foetal death, marriage, divorce, adoption, legitimation, recognition, annulment, or legal separation.

Vital record — see "registration record".

Vital statistics are the facts, systematically collected and compiled in numerical form, relating to or derived from records of vital events.

ANNEX 3

DEFINITION OF STILLBIRTH: 84 GEOGRAPHIC AREAS, AS OF 1 JANUARY 1950

(The source of each definition is indicated by a code, the explanation of which will be found on p. 235.)

Argentina

Infants dead at time of registration are inscribed in the register of death with no distinction as to whether they were stillborn or liveborn.

For statistical purposes,

"A birth will be considered live if the persons present at the childbirth heard the breathing or voice of the child or observed other signs of life and if the child did not die before complete separation from the mother". (translated from Spanish, Source 1)

Australia

"All States except Queensland and Tasmania register stillbirths compulsorily . . . all using the 28-weeks definition. New South Wales, Australian Capital Territory and Northern Territory use an auxiliary definition in terms of length (14 in.) and Victoria uses an auxiliary definition in terms of weight (2 lb. 12 ozs.) to be applied in cases where period of gestation is unknown." (Source 2)

Austria

"Stillbirth or dead at birth when it is at least 35 cm. long but fails to begin natural breathing . . . less than 35 cm. long are considered to be miscarriages." (translated from German, Source 3)

Belgium

"Officially, a 'still-birth' is defined as the birth of a dead child after the 180th day of gestation, but according to established procedure, under 'still-born' are included: (*a*) children born dead, (*b*) children born alive, but dying before registration (i.e. within three days of birth).

"A circular issued by the Ministry of the Interior in 1880, which is still in force says: 'The returns of stillbirths compiled from the registry of deaths may include not only children actually born dead, but also children who, although born alive, died on the first, the second, or even the third day after birth, but who must be regarded as still-born, since they were not returned as live-births to the Public Registrar, and consequently could not be entered in the register of births'." (Source 4)

Bolivia

"A dead-birth is the birth of a (viable) foetus, after at least 28 weeks' pregnancy, in which pulmonary respiration does not occur; such a foetus may die either: (*a*) before, (*b*) during or (*c*) after birth, but before it has breathed." (translated from Spanish, Source 1)

Brazil

Prior to 1 January 1950:

The legal definition of stillbirth is: "A child who does not show signs of life at birth or who dies during the delivery".

For statistical purposes, the Serviço Federal de Bioestatística has adopted the League of Nations Health Organisation definition, as follows: "A dead-birth is the birth of a foetus, after at least 28 weeks' pregnancy, in which pulmonary respiration does not occur; such a foetus may die either: (*a*) before, (*b*) during or (*c*) after birth, but before it has breathed." (Source 5)

Beginning 1 January 1950:

It is reported that as of 1 January 1950, Brazil adopted the international standard definition of foetal death given on p. 60. (Source 6)

British Honduras

"Any child which has issued forth from its mother after the twenty-eighth week of pregnancy and which did not at any time after being completely expelled from its mother, breathe or show any other signs of life." (Source 3)

Bulgaria

The Bureau of General Statistics makes the following remarks on its instructions for the filling of questions on the stillbirth registration act: "All the viable newborn, i.e., carried by the mother for at least six months, but born without life must be registered as stillbirths. Stillbirth figures must not include any stillborn who after birth has breathed, not even an instant. Nor should they include infants measuring less than 32 cm. in length." (translated from French, Source 7)

Burma

It is reported that as of 1951, Burma adopted the international standard definition of foetal death given on p. 60. (Source 6)

Canada

The Canadian definition of a stillbirth, adopted for statistical purposes, is as follows: "Birth of a (viable) foetus after at least 28 weeks pregnancy in which pulmonary respiration does not occur; such foetus may die either (*a*) before, (*b*) during, or (*c*) after birth, but before it has breathed". Prior to 1932, the period was six months. (Source 3)

Ceylon

"Born after the twenty-eighth week of gestation as dead or apparently dead and not called back to life". (Source 3)

Chile

Prior to 1943: "Those dying within the mother, or before complete separation from the mother". (translated from Spanish, Source 8)

From 1944 on: "A dead-birth is the birth of a (viable) foetus, after at least 28 weeks' pregnancy, in which pulmonary respiration does not occur; such a foetus may die either: (*a*) before, (*b*) during or (*c*) after birth, but before it has breathed." (translated from Spanish, Source 8)

Colombia

Stillbirths are not required to be registered; therefore, there is no legal definition. For statistical purposes, the following is used: "A stillbirth is understood thus: (*a*) a creature that is born after more than six months of intra-uterine life and does not breathe at the moment of the separation from its mother; (*b*) the creature dying at the moment of birth." (translated from Spanish, Source 1)

Costa Rica

Prior to January 1952:

"Stillbirth is a person who after the 28th week of gestation is expelled from its mother's womb and shows no action of the main cells or systems in its body, particularly of the circulatory and respiratory systems." (translated from Spanish, Source 9)

Beginning January 1952:

It is reported that as of January 1952, Costa Rica adopted the international standard definition of foetal death given on p. 60. (Source 6)

Cuba

There is no definition of stillbirth in Cuba, but the intention may be seen from articles in the Civil Code. "For civil purposes, only that foetus which is born with human appearance and which survives 24 hours after complete separation from the body of its mother, can be accepted as [live] 'born'." (translated from Spanish) Therefore, the concept of stillbirth in Cuba does not refer exclusively to the foetus born without life, that is to say, to one not viable physically or to one which has not breathed, but it refers to a birth which does not survive 24 hours, that is, to one which lacks *legal* viability. (Source 1)

Czechoslovakia

"Particulars concerning a stillborn child shall be entered only in the register of births, the word 'stillborn' being entered in the name and surname column. The term 'stillborn children' shall be deemed to include dead foetuses weighing more than 400 grammes." (translated from Czech, Source 1)

Denmark (also Faeroe Islands and Greenland)

"Every foetus leaving the womb during or after the twenty-ninth week of gestation and not presenting any sign of life is registered as stillborn. When the event takes place before the twenty-ninth week, it is considered as an abortion and not registered." (Source 3)

Dominican Republic

"A dead-birth is the birth of a foetus, after at least 28 weeks' pregnancy, in which pulmonary respiration does not occur; such a foetus may die either: (*a*) before, (*b*) during or (*c*) after birth, but before it has breathed." (translated from Spanish, Source 1)

It is reported that the Dominican Republic adopted the international standard definition of foetal death given on p. 60, but no effective date is indicated. (Source 6)

Ecuador

The Civil Code of Ecuador does not recognize legal existence of a creature who has not lived at least 24 hours. (Source 1) Therefore, an infant who fails to survive 24 hours is considered not legally viable and is registered as stillborn, together with those foetuses born dead, i.e., those not physically viable.

Beginning 1945, physical viability for statistical purposes was defined as follows:

Stillbirth is "the birth of a foetus, after at least 28 weeks' pregnancy, in which pulmonary respiration has not occurred. Such foetus may die either before, during, or after the delivery, that is, the separation from the womb of the mother, but in any case before it has breathed". (translated from Spanish, Source 1)

Egypt

"A still birth is defined as: Every child born after six months of intra-uterine life without showing any sign of life." (Source 3)

It is reported that Egypt adopted the international standard definition of foetal death given on p. 60, but no effective date is indicated. (Source 6)

El Salvador

Stillbirths are not required to be registered; therefore, there is no legal definition. For statistical purposes, the following is used:

"Stillbirths are those foetuses who have reached the 7th month of gestation (28 weeks) or beyond and who on separation from the body of the mother have given no sign of life: breathing, pulsation of cord, movement of heart or voluntary muscle, or crying." (translated from Spanish, Source 1)

England and Wales

"Any child which has issued forth from its mother after the twenty-eighth week of pregnancy and which did not at any time after being completely expelled from its mother breathe or show any other sign of life". (Source 3)

Faeroe Islands—see Denmark.

Federation of Malaya

" 'Still born' and 'still-birth' shall apply to any child which has issued forth from its mother after the twenty eighth week of pregnancy and which did not at any time after being completely expelled from its mother breathe or show any other signs of life." (Source 1)

Finland

"Every child born at full term and who at birth does not give any sign of life is considered as stillborn. The registration as stillborn is required for every foetus which is born without life after six months of gestation." (Source 10)

It is reported that Finland adopted the international standard definition of foetal death given on p. 60, but no effective date is indicated. (Source 6)

France

. . . "there exists no legal definition indicating how to distinguish whether the dead product of a confinement is a non-viable foetus (it is then a miscarriage) or a viable foetus (it is then a stillbirth). Because of the lack of a legal definition, the following provisions have been made: . . .

"If a product of a confinement is a dead foetus of *less* than 180 days of gestation (or less than 4 months in Paris), the foetus is considered as non-viable and the event is not required to be registered.

"If the period of gestation is more than six months, the specification is to find out if the foetus may be recognizable as a human being and if its sex is recognizable; in the negative case, there is no registration. In the affirmative case, the stillbirth registration procedure is as follows:

"When a *stillbirth* is reported, the civil registration officer does not fill out either a certificate of birth or of death, but he only registers in the register of deaths (without mentioning whether the infant lived or not) *an infant presented dead.* So it is with live-born infants *who died before the registration.* Thus, the registration of infants presented dead relates both to actual stillbirths and to infants who died before the registration as a live birth." (translated from French, Source 1)

"The distinction between live birth and foetal death based on the observation of 'any evidence of life' is too subtle and uncertain. In accordance with French medico-legal theory, French demographic statistics distinguish only between children which 'have breathed' and those which have not, the more so because births and foetal deaths are not necessarily certified by a medical practitioner or a midwife." (translated from French, Source 2)

French Morocco

"Deaths of children within 72 hours after birth.

"(*a*) If the birth has been registered before the declaration of death, an act of birth and an act of death are prepared.

"(*b*) If the declaration of birth and death are made simultaneously, the child is counted as stillborn and the registration is made only in the register of deaths.

"The statistical report of stillbirth has the following question: 'Did the child breathe?' in order to separate the legal stillbirths from the physiological ones." (translated from French, Source 1)

German Federal Republic

"Stillborn infants [are] foetuses at least 35 cm. in length which have not begun natural respiratory action". (translated from German, Source 2)

Gold Coast

"A still-birth is the birth of a child born after the twenty-eighth week of pregnancy which after complete expulsion from the mother did not breathe or show any signs of life." (Source 1)

Greece

"The newly born who did not breathe". (translated from French, Source 3)

"A dead birth is when the new-born showed no evidence of life, such as breathing after separation from mother. This indicates that the new-born died before or during the labour of birth. . . . If the new born showed evidence of life, i.e., if it breathed but died afterwards and before this declaration is made, this was a live birth. In this case the Registrar will fill up two certificates, one for birth (live) and the other for death." (translated from Greek, Source 1)

Greenland—see Denmark.

Guatemala

"A stillborn child is one who did not breathe after birth." (translated from Spanish, Source 1)

Guernsey Is.

" 'Stillbirth' refers to children born dead." (Source 3)

Haiti

It is reported that Haiti has adopted the international standard definition of foetal death given on p. 60, but no effective date is indicated. (Source 6)

Honduras

Stillbirths are not required to be registered; therefore, there is no legal definition. For statistical purposes, the following is used:

"Stillbirth — It is the birth of a viable foetus of not less than 28 weeks (7 [lunar] months) of pregnancy in which there is no pulmonary respiration, beating of the heart, or voluntary movement of the muscles." (translated from Spanish, Source 1)

Hungary

"Not alive at the beginning of the childbirth or died during the course of the childbirth". (Source 3)

"A still-born child is one who dies before, during, or at the moment of birth. If the foetus shows any signs of life, for any time however short, after delivery, the case is regarded as that of a live birth, when the child must be registered both as a live birth, and as a death." (Source 4)

"Stillborn is a child who is not living at the moment of the separation from its mother, the death having occurred before or during the delivery. When it can be conclusively established that the duration of gestation was not longer than seven months, the foetus is considered as born before term. The registration of miscarriages is not required. However, when a foetus shows any sign of life, regardless of its stage of development, it is considered as having been born alive and must be registered as both a live birth and as a death." (translated from French, Source 7)

Iceland

"Children born without any clear sign of life after six and a half months (28 weeks) of pregnancy are counted as still-born children." (translated from Icelandic, Source 1)

India

"A still-birth is the birth of a foetus after 28 weeks of pregnancy in which pulmonary respiration does not occur; such a foetus may die either (*a*) before (*b*) during or (*c*) after birth but before it has breathed." (Source 1)

Ajmer-Merwara

"A foetus which dies during the course of delivery". (Source 3)

Coorg

"Viable child born dead". (Source 3)

East Punjab

"Viable child born at or about full time which never breathes or shows any other sign of life after complete separation from the mother". (Source 3)

Madras, Orissa, and *Bihar*

"Children born dead". (Source 3)

Bombay, United Provinces, Assam, and *Bengal*

"A foetus after 28 weeks of pregnancy in which pulmonary respiration does not occur. Such foetus may die either before, during or after birth but before it has breathed". (Source 3)

Delhi and *Central Provinces*

"Any child which has issued forth from its mother after 28th week of pregnancy and which did not at any time after being completely expelled from its mother breathe or show signs of life". (Source 3)

Indonesia (not available)

Iran (not available)

Iraq

It is reported that Iraq has adopted the international standard definition of foetal death given on p. 60, but no effective date is indicated. (Source 6)

Ireland (Republic of)

Stillbirths are not required to be registered. No definition available.

Israel

"A child who breathed and died shortly thereafter is regarded as having been born alive." (Source 1)

It is reported that as of May 1953, Israel adopted the international standard definition of foetal death given on p. 60. (Source 6)

Italy

"Infants born without life after the sixth month of pregnancy". (translated from Italian, Source 3) This may be clarified by the definition of live birth which is "any child born after the sixth month of gestation and breathing for a certain time even if dead before declaration of birth". (Source 1)

It is reported that as of 1952, Italy adopted the international standard definition of foetal death given on p. 60. (Source 6)

Japan

"The declaration of stillbirth shall be made for stillbirths over 3 months of pregnancy." (translated from Japanese, Source 1)

It is reported that Japan adopted the international standard definition of foetal death given on p. 60, but no effective date is indicated. (Source 6)

Jordan

Stillbirths are not required to be registered. But it is reported that as of February 1950, Jordan adopted the international standard definition of foetal death given on p. 60. (Source 6)

Korea

It is reported that as of 1954, Korea adopted the international standard definition of foetal death given on p. 60. (Source 6)

Lebanon

Stillbirths are not required to be registered. No definition available.

Liechtenstein

"All live-births and all still-births occurring after six months of pregnancy, shall be notified to the registrar within three days of their occurrence; nevertheless, notifications received after that period shall be accepted." (translated from German, Source 1)

Luxembourg

The decree of 3 July 1806 reads as follows: "When the body of a child whose birth has not been registered is presented to the Registrar, the latter shall not state that such a child died but only that it was presented to him without life . . . this decree applies to a case where the child is stillborn, that is, where it is sufficiently ascertained that it has not lived a single instant after having left the womb of the mother." (translated from French, Source 1)

Mauritius

"A child born dead at or after the seventh month of pregnancy". (Source 3)

Mexico

"A still-birth is the birth of a viable foetus in which pulmonary respiration has not occurred; such foetus may die either: (*a*) before, (*b*) during or after childbirth, but in any case before it has breathed." (translated from Spanish, Source 3)

"Miscarriage (intra-uterine product of less than six months) . . ." (translated from Spanish, Source 1)

It is reported that as of January 1950, Mexico adopted the international standard definition of foetal death given on p. 60 (Source 6)

Monaco (not available)

Netherlands

The concept of "stillborn" is not used in registration; infants dead at time of registration are inscribed as "dead before registration," with no distinction as to whether they were "stillborn" or liveborn.

For statistical purposes, however, beginning 1 January 1950:

". . . a stillborn child means a foetus which:
"1. is at least 28 weeks old and 35 cm. long.
"2. after delivery shows no sign of life (respiration, heart action, muscular contraction).

"In the case of foetuses, under 28 weeks old and less than 35 cm. long, the word 'foetus ___weeks old' should be entered under 'Remarks' if the foetus showed signs of life." (translated from Dutch, Source 1)

Prior to 1 January 1950, length of gestation was set at 26 weeks, rather than 28. (Sources 1 and 3)

It is reported that as of 1950, the Netherlands adopted the international standard definition of foetal death given on p. 60. (Source 6)

New Zealand

"A still-born child is one which is deemed to have issued from its mother after the expiration of the twenty-eighth week of pregnancy and which was *not alive* at the time of such issue. Generally speaking, a child is deemed to have been born dead when it has neither breathed nor shown any sign of life after being completely born. The term 'completely born' may be defined as the instant of complete separation of the entire body of the child from the body of the mother. A child born alive but dying soon after birth, no matter how brief that period may be, is a live birth, and must not on any account be registered as still-born. No registration is required in respect of a child *born dead before* the twenty-eighth week of pregnancy." (Source 1)

It is reported that as of 1953, New Zealand adopted the international standard definition of foetal death given on p. 60. (Source 6)

Nicaragua

Legally, an infant is considered to be stillborn if it has never breathed. (Source 1) For statistical purposes:

"A dead-birth is the birth of a foetus (viable), after at least 28 weeks' (7 months) pregnancy, in which pulmonary respiration does not occur; such a foetus may die either: (*a*) before, (*b*) during or (*c*) after birth, but before it has breathed." (translated from Spanish, Source 1)

Northern Ireland

Stillbirths are not required to be registered. No definition available.

Norway

"Infants born after the 28th week of pregnancy and showing no signs of life". (Source 3)

It is reported that as of 1954, Norway adopted the international standard definition of foetal death given on p. 60 (Source 6)

Pakistan (not available)

Panama

"If it is an abortion, but the child shows signs of life, it must be considered a birth and the form must be filled in. In the case of a dead-born (no breathing or other signs of life after 5 months of gestation), information will be given as stillbirth." (translated from Spanish, Source 1)

It is reported that as of 1950, Panama adopted the international standard definition of foetal death given on p. 60. (Source 6)

Panama Canal Zone

Definitions of stillbirths, causes of death, etc., conform with those contained in the Manual of the International List of Causes of Death (5th Revision) and Joint Causes of Death (4th Edition), 1939. (Source 1)

Paraguay

"A dead-birth is the birth of a foetus, after at least 28 weeks' pregnancy, in which pulmonary respiration does not occur; such a foetus may die either: (*a*) before, (*b*) during or (*c*) after birth, but before it has breathed." (translated from Spanish, Source 1)

Peru

Stillbirths are not required to be registered; therefore, there is no legal definition. For statistical purposes, the following is used:

"A dead-birth is the birth of a foetus, after at least 28 weeks' pregnancy, in which pulmonary respiration does not occur; such foetus may die either: (*a*) before, (*b*) during or (*c*) after birth, but before it has breathed." (translated from Spanish, Source 3)

Philippines

"Stillbirth shall include all stillborn babies that have attained the 5th month of uterogestation." (Source 1)

"A stillborn child is one that neither breathes nor shows other evidence of life after birth." (Source 1)

Poland

"Children born after a pregnancy of at least seven months and who at the time of severance of the umbilical cord gave no sign of life, unless they were subsequently restored to life. On the other hand, a child who gave signs of life but died immediately after birth, that is, after severance of the umbilical cord, is not a stillborn child." (translated from Polish, Source 1)

Portugal

"Any foetus born dead [without life] but so developed as to be recognizable as a human form". (translated from Portuguese, Source 1)

Romania

"Any embryo expelled after a gestation period of six and a half months and therefore viable, whose pulmonary respiration has not been established so that death might have occurred before, during labour or after birth". (translated from French, Source 3)

Scotland

"Any child which has issued forth from its mother after the twenty-eighth week of pregnancy and which did not at any time after being completely expelled from its mother breathe or show any other signs of life". (Source 3)

Southern Rhodesia

"The delivery of any formed child which has not shown any sign of life after complete birth. By the term 'formed' is meant any foetus at such stage of development as to be readily recognisable by any uninstructed person as a human child". (Source 3)

South-West Africa

"Stillbirth applies to a viable child which showed no sign of life after complete birth." (Source 3)

Spain

"Stillbirths are inscribed in the civil registries in a special book, without legal formality, stillbirths being considered those not living 24 hours, since before this age one neither acquires nor transmits rights; [registration] consists of personal data of the parents and their domicile, whether the stillborn was 'dead before birth', 'dead in the act of birth' or 'hours (less than 24) lived after birth'." (translated from Spanish, Source 1)

Sweden

"By child is meant a newly-born infant that has breathed after birth, or a still-born infant not less than 35 cm. long." (translated from Swedish, Source 1)

Switzerland

"No sign of life after complete expulsion (head, body and limbs) from maternal organs. Compulsory declaration as understood in the civil code . . . is not applicable unless total length of the newborn exceeds 30 cm." (translated from French, Source 3)

Syria

Stillbirths are not required to be registered. No definition available.

Thailand

"A death-birth (stillbirth) is the birth of a (viable) foetus, after at least twenty-eight weeks of pregnancy, in which pulmonary respiration does not occur; such a foetus may die either (*a*) before, (*b*) during or (*c*) after birth, but before it has breathed." (Source 3)

It is reported that as of 1950, Thailand adopted the international standard definition of foetal death given on p. 60. (Source 6)

Trieste—Commune

"Born dead *after* the sixth month of pregnancy". (Source 3)

Trinidad and Tobago

" 'Still birth' applies to any child which has issued forth from its mother after the twenty-eighth week of pregnancy and which did not at any time after being completely expelled from its mother, breathe or show any other sign of life." (Source 3)

Turkey

Stillbirths are not required to be registered; therefore, there is no legal definition. For statistical purposes, the following is used:

"A child breathing for however short a time after birth will not be regarded as stillborn." (translated from Turkish, Source 1)

It is reported that as of January 1950, Turkey adopted the international standard definition of foetal death given on p. 60. (Source 6)

Union of South Africa

" 'Stillbirth' applies to a viable child which showed no sign of life after complete birth." (Source 3)

United States

Prior to 1951: The National Office of Vital Statistics defined stillbirths as follows: "A fetus showing no evidence of life after complete birth (no action of heart, breathing, or movement of voluntary muscle) if the 20th week of gestation has been reached, should be registered as a stillbirth." (Source 1)

The definitions of stillbirth followed in some states differ from the standard definition given above, particularly with respect to the minimum period of gestation for which a stillbirth report is required. For definitions in force in the various states, see *Major Problems in Fetal Mortality* by J. Yerushalmy and Jessie M. Bierman. Federal Security Agency. Public Health Service. National Office of Vital Statistics. Vital Statistics—Special Reports. Selected Studies, Vol. 33, No. 13, Washington, 22 May 1952. p. 232-236.

Beginning 1951: The international standard definition of foetal death given on p. 60 was adopted. (Source 1)

Uruguay (not available)

Venezuela

"*Stillbirth* is a foetus without evidence of life (the heart does not function, there is no pulmonary respiration and no movements of voluntary muscles) with 6 or more months of intra-uterine life." (translated from Spanish, Source 1)

It is reported that as of January 1951, Venezuela adopted the international standard definition of foetal death given on p. 60. (Source 6)

Yugoslavia

"Children born after a gestation period of at least 7 months or 28 weeks approximately are classified as stillbirths if palpitation, i.e., heart beating, immediately after birth has not been proved.

"Abortion is defined as each act of expulsion of dead products of gestation of shorter length than 7 months or 28 weeks, approximately. These products are not registered in the civil registers." (translated from French, Source 1)

It is reported that as of 1951, Yugoslavia adopted the international standard definition of foetal death given on p. 60. (Source 6)

Zanzibar and Pemba

"A child is said to be 'still-born' if it is already dead when born." (Source 3)

CODE TO SOURCES OF DEFINITIONS OF STILLBIRTH (FOETAL DEATH)

1. Documents on file in United Nations under "Methods of Registration", File No. ECA 163/2/02(2).
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6. *WHO Definitions of "Live Birth" and "Foetal Death".* Document WHO-UN/Conf.Nat.Com./40, 30 September 1953. 12 p. Mimeo.

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SUBJECT INDEX

Abortions, 53, 54
Absolute numbers:
  limitations of, 184
  uses of, 184
Accuracy and completeness of data:
  evaluation of, 200-212
  methods of improving, 94-95, 110, 126, 153, 156
Adjusted rates:
  by direct method, 196
  by indirect method, 196
  equivalent average death rate, 196-197
  gross reproduction rate, 197
  life-table death rate, 196
Administrative organization for registration, 26-36
Adoption, statistical definition of, 63
Age:
  definition and classification, 121-122
  problems of obtaining, 122-123, 158
  tabulations, 175-182
  uses of data, 120-121
Age-adjusted rates—*see* Adjusted rates
Age-limited birth rate, formula for, 187
Algebraic formulae for tabulation description, 158-159
Analysis (statistical), defined, 228
Analytical method of obtaining vital statistics, 7
Annual tabulation programme, 173-179
  planning of, 154
Annulment, statistical definition of, 62
Assembling, defined, 228
Attendant at birth:
  definition and classification, 123
  problems of obtaining, 123
  tabulations, 174, 180
  uses of data, 123
Attribute classifications, 157-158, 186
Belated registration—*see* Delayed registration
Birth—*see* Live birth
Birth order (*see also* Number of children born to this mother):
  defined, 140
  tabulations, 175, 177, 180
Birth-place—*see* Place of birth
Birth rate—*see* Live-birth rate
Birth ratios, 188
Birth record—*see* Live-birth record
Births, plural, 147-148
Book registers, 90-95
Calendar periods for tabulations, 129, 168
Cause of death:
  centralized coding of, 153
  certification of, 126
  classification of, 125, 158
  defined, 126
  international recommendation, 123-126
  item on vital records, 95-96
  problems of obtaining, 126-127
  tabulations, 175-177, 181-182
  uses of data, 123
Cause-of-death rate:
  formula for, 189
Cause-of-death rate (continued)
  uses of, 16
Census method of obtaining vital statistics—*see* Enumeration method
Centralized control of registration, 26-36
  advantages of, 33
Centralized vs. decentralized compilation, 36-40
  international recommendation, 150, 153
  national practice, 150-151
Certification of cause of death, 126
Certifier:
  definition and classification, 127
  problems of obtaining, 127
  tabulations, 176, 180, 182
  uses of data, 127
Check boxes, use of on statistical reports, 112
Chronological history of registration and statistics, 4, 19-25, 213-216
Citizenship—*see* Nationality
Civil registration (registers):
  advantages and disadvantages, 34-36
  countries maintaining, 34
  history of, 4, 19-25
Classification:
  attribute, 157-158, 186
  by locality size, 146
  by urban-rural, 146
  characteristics of, 157-158
  defined, 157, 228
  qualitative, 157
  quantitative, 157
  standard, 158
  types of, 157-158
Classification schemes, suggested, 120-149 (*see also* under Age, Occupation, etc.)
Coding:
  advantages of centralized, 153, 157
  and written instructions, 157
  code boxes, 112
  defined, 156-157
Collection, defined, 229
  control of, 153, 155
Comparability, lack of, 8-9
Compilation of vital statistics, 150-163
  by health services, 37, 38, 39
  by registration services, 37, 39
  by statistical services, 37-38
  centralized—decentralized, 36-37, 150-154
  defined, 229
  from individual reports, 150-154
  from list reports, 150-154
  from summary reports, 150-154
  international recommendation, 150
  organization for, 36-40
Completeness and accuracy of data:
  evaluation of, 200-212
  methods of improving, 94-95, 110, 126, 153, 156
Completeness of registration:
  methods of improving, 19, 25, 74, 80, 89, 209
  methods of testing, 200-208
    by checking totals and delays, 201
    by comparing census results, 201-202
    by matching records, 202
  uses of completeness measures, 209
Compulsory nature of registration:
  dates of national legislation, 20-24
  international recommendation on, 19
Computing, 162
  of rates and indices, 184-199
Conferences, as means of co-ordination, 43
Confidentiality, international recommendation, 100
Confinement tabulation, 177
Consensual marriages, 60-61, 138
Consolidation, defined, 229
Control of collection, 153, 155
Control of errors, 161-162
Co-ordination:
  international recommendation, 40-41
  methods of achieving, 40-45
  need for, 33
  statistics requiring, 43-45
  types of, 40-45
Copies:
  methods of preparing certified, 100
  of statistical reports, 111
Correction of registers, 99-100
Cost of current registration, 80-83
  international recommendation, 80-81
Court registers, 34
Coverage of tabulations:
  cut-off date, 170-171
  ethnic, 165
  geographic, 164-165
Crude-rate formula, 186
  death, 189
  divorce, 194-195
  foetal death, 192-193
  live birth, 187
  marriage, 193-194
  stillbirth, 193
Cut-off date for tabulations, 153, 170-171
Date of birth:
  definition and classification, 127
  problems of obtaining, 122-123
  tabulations of age, 175-182
  uses of data, 120-121
Date of marriage:
  definition and classification, 128
  problems of obtaining, 128
  tabulations of duration of marriage, 179-180
  uses of data, 127-128
Date of occurrence:
  as a basis for tabulations, 168-170
  definition and classification, 129
  problems of obtaining, 129
  tabulations, 174-183
  uses of data, 128
Date of registration:
  as a basis for tabulations, 168-170
  definition and classification, 129
  problems of obtaining, 129
  uses of data, 129
Dates of national compulsory registration legislation, 20-24
Death:
  cost of registering, 80-83
  informant, 75
  place of registration, 77-80

Death (continued)
statistical definition of, 53
tabulations, 175-177, 180-182
time allowed for registering, 83-87
Death (mortality) rates:
adjusted, 195-197
cause, 189
crude, 189
equivalent average, 196-197
foetal mortality, 192-193
hebdomadal, 192
infant mortality, 190-192
life table, 198
maternal mortality, 189
neonatal mortality, 191
perinatal, 142, 193
specific, 190
Death ratios, 192-193
Death record, uses of, 13, 14
Death register:
characteristics of, 90-95
items on, 95-96
definition of, 96
Death statistical report:
items collected, 117, Table 14
items recommended, 114
types of, 105-108
Decentralized compilation, disadvantages of, 151-153
Declarant—*see* Informant
"Declared" events:
defined, 88
registration of, 88
Deficiencies in vital statistics, 8-9
Definitions (*see also* under Age, Occupation, etc.):
events to be registered, 46-63
effect on statistics, 49, 52-53, 58-59, 61, 63
items on registers, 96
items on statistical reports, 120-149
international recommendation, 120
vital events, 229
vital records, 3
vital statistics, 3
Delayed registration, 87-89
as a measure of registration completeness, 89, 201
defined, 88
effect on statistics, 89
international recommendation, 88
reasons for, 87
universality of, 87
Delinquent registrations—*see* Delayed registration
Dependent children—*see* Number of dependent children
Digit preference as a factor in quality control, 210-211
Distribution, defined, 229
Divorce:
cost of registering, 80-83
informant, 76
place of registration, 77-80
statistical definition of, 62-63
tabulations, 178-179, 182
time allowed for registering, 83-87
Divorce rates:
crude, 194
specific, 195
Divorce record, uses of, 13, 14
Divorce register:
characteristics, 90-95
definition of items, 96
Divorce statistical report:
items collected, 119, Table 17
items recommended, 115
types of, 105-108
Duplicate registers, 98
Duration of marriage, tabulations, 179-180 (*see also* Date of marriage)
Duration of pregnancy, 143
Ecclesiastical registers:
advantages—disadvantages, 35
countries maintaining, 34
deficiencies of, 3
history of, 3-4
Economic characteristics:
definitions and classifications, 131-133
problems of obtaining, 133-134
tabulations, 180-182
uses of data, 129-131
Editing of statistical reports, 156, 161
Efforts to improve vital statistics, history of, 9-11
Enumeration method for obtaining vital statistics, 5
deficiencies of, 6
history of in Canada and the United States, 5-6
Equivalent average death rate, 196, 197
Error-control programme, 161-162
Estimation of vital statistics, 7
Evaluation:
of quality of data, 210-212
by analysis of tabulations, 211-212
by item matching, 210
of quantity of data, 200-208
of vital-statistics system, 200-212
international recommendation, 200
Extended tabulation programme, suggestions for, 179-182
Fertility rate, 187
Filing of records, 98
Foetal death (*see also* Stillbirth):
cost of registering, 80-83
informant, 75-76
place of registration, 78-80
statistical definition of, 59-60
tabulations, 177, 182
time allowed for registering. 83-87
Foetal-death rates, 192-193
formula for, 193
uses of, 16
Foetal-death ratio, 193
Foetal-death record, uses of, 13
Foetal-death register:
characteristics of, 90-95
items on, 96
Foetal-death statistical report:
items collected, 118, Table 15
items recommended, 114
Foetal mortality measures, uses of, 16
Formulae:
for description of tabulations, 158-159
for rates and indices, 184-199
"General" rates, 186
Geographic reference for tabulations, 171-172
Gestation period—*see* Period of gestation
Global rates, 186
Glossary of technical terms, 228-229
Gross rates, 186
Gross reproduction rate:
accuracy of, 198
defined, 197
method of calculating, 197
uses of, 197
Health-department registers:
advantages and disadvantages, 34-36
countries maintaining, 34
Health services as compilers of vital statistics, 38-39
Health statistics, relation to vital statistics, 44
Heaping as a factor in quality evaluation, 210-211
Hebdomadal death rate, 192
History:
civil registration, 4, 19-25
ecclesiastical registers, 3-4
efforts to improve vital statistics, 9-11
registration legislation, 19-25
vital records, 3-5, 8-9, 20-24
vital statistics, 3-5, 8-9, 24
Hospitalization:
definition and classification, 134
problems of obtaining, 134
tabulations, 180, 182
uses of data, 134
Immaturity—*see* Prematurity
Improvement of efficiency of registrars, 67-69, 209
international recommendation, 68
Improvement of statistical data by querying, 156
Incentives to registration, 12-13, 25-26, 35, 76, 209
Incompleteness of registration—*see* Completeness
Indexes and indexing, 99
Indices, derived, 195-199
Individual (single-unit) statistical reports, 103-108, 150
advantages of, in compilation, 150, 153-154
as reporting device, 153
international recommendation, 103-104
Industry:
definition and classification, 131, 158
problems of obtaining, 133-134
tabulations, 181
uses of data, 129-131
Infant-death tabulations, 176, 177, 181
Infant mortality rate, 190-193
formula, 191
use of, 15, 16
Informant:
alternate, 69-70
defined, 69
duties and responsibilities of, 69-70
effect on statistics, 74, 75, 76
for death, 75
for divorce, 76
for live birth, 70-75
for marriage, 76
for stillbirth, 75-76
identity of, 70-76
relationship of registrar with, 64-65, 209
Ink:
coloured, 111
specifications for, 98
Instruction manuals:
for coders, 157
for registrars, 68, 96, 108
International Form of Medical Certification of Cause of Death, 10, 104, 108-109, 124, 126
International Standard Classification of Occupations, 130-132
International Standard Industrial Classification of all Economic Activities, 130-132, 158
International Statistical Classification of Diseases, Injuries, and Causes of Death, 10, 108, 124-126, 130, 148, 158
Item matching, a technique for evaluation, 210
Items on registration records:
classified, 95-96

Items on registration records (continued)
  definition of, 96
  international recommendation, 95-96
Items on vital-statistics reports (*see also* under Age, Occupation, etc.):
  classification of each, 120-149
  compared to items on registers, 113
  countries collecting each, 115, 116
  defined, 120-149
  international recommendation, 113-119
    for death report, 114
    for divorce report, 115
    for foetal-death report, 114
    for live-birth report, 114
    for marriage report, 115
  items collected nationally, 116-119, Tables 13-17
  problems relating to, 120-149
  rank order by number of countries collecting, 117-119
  uses, 120-149
Language:
  definition and classification, 134
  problems of obtaining, 134-135
  uses of data, 134
Late foetal-death ratio, 193
Late registration—*see* Delayed registration
Legislation governing registration, 19-25
  dates of national decrees, 20-24
  enforcement of, 25-26
Legitimacy:
  definition and classification, 135
  problems of obtaining, 135
  tabulations, 175, 177, 180-182
  uses of data, 135
Legitimation, statistical definition of, 63
Level of formal education:
  definition and classification, 136
  problems of obtaining, 136
  tabulations, 180-182
  uses of data, 135
Life table, 198-199
Life-table death rate, 198
List (multi-unit) statistical reports, 104-108
  as reporting device, 150-154
  in compilation, 150
Literacy:
  definition and classification, 137
  problems of obtaining, 137
  tabulations, 180-182
  uses of data, 136
Live birth:
  cost of registering, 80-83
  criteria for registration as, 48-49
  informant, 70-75
  place of registration, 77-80
  statistical definition, 46-53
  tabulations, 174-175, 180
  time allowed for registering, 83-87
Live-birth order (*see also* Number of children born to this mother):
  defined, 140
  tabulations, 175, 180
Live-birth rates:
  adjusted, 195, 197
  age-limited, 187
  crude, 187
  specific, 187-188
Live-birth ratio, 188
Live-birth record, uses of, 12-14, 89
Live-birth register
  characteristics of, 90-95
  items on, 95
    definition of, 96
Live-birth statistical report:
  items collected, 117, Table 13
Live-birth statistical report (continued)
  items recommended, 114
  type of, 105-108
Locality—*see* Hospitalization
Locality-size classification, 146
Loose-leaf register, 90-95
Mailing lists, 163
Manual tabulation, 159-160
Marital status:
  definition and classification, 137-138, 158
  problems of obtaining, 138
  tabulations, 181
  uses of data, 137
Marriage:
  cost of registering, 80-83
  informant, 76
  Moslem marriage, 61
  place of registration, 78-80
  statistical definition of, 60-62
  tabulations, 178, 182
  time allowed for registering, 83-87.
Marriage birth order, defined, 140
  (*see also* Number of children born to this mother)
Marriage order, tabulations, 182
  (*see also* Number of previous marriages)
Marriage rates:
  crude, 193
  specific, 194
Marriage record, uses of, 13, 14
Marriage register:
  characteristics of, 90-95
  items on, 96
    definition of, 96
Marriage statistical report:
  items collected, 118-119, Table 16
  items recommended, 115
  types of, 105-108
Maternal mortality rate:
  formula for, 190
  use of, 16
Measures of registration completeness, utilization of, 209-210
Mechanical tabulation, 160
Medical Certificate of Cause of Death—*see* International Form of Medical Certification of Cause of Death
Medical certificate of foetal death, 124
Medical certification of cause, 104, 123-124
Medical research, use of vital statistics for, 15
Medical statistics, relation to vital statistics, 45
Methods:
  of controlling receipt of statistical reports, 155
  of co-ordinating vital-statistics system, 40-45
  of improving accuracy of data, 94-95, 110, 153
  of improving completeness of registration, 19-25, 69-76, 80-83, 89, 209-210
  of improving efficiency of registrars, 40-43, 67-69, 102
  of making an index, 99
  of obtaining vital statistics, 5-7
  of selecting "tabulation areas", 167
  of tabulating, 154, 159-160
  of testing completeness of registration, 200-208
Microfilm:
  and record storage, 98
  and statistical reporting, 111
Migration statistics, relation to vital statistics, 44
Monthly rates, adjusted to annual basis, 186
Month-of-occurrence tabulations, 175-178
Mortality—*see* Death rates
Mother tongue—*see* Language
Multiple births, 147-148
  tabulations, 177
Multi-unit reports, 104-108
  as reporting devices, 150-154
  in compilation, 150
Napoleonic Code, 4
Natality—*see* Live-birth rates
National Committees on Vital and Health Statistics, 41-42
  composition of, 42
Nationality:
  definition and classification, 138-139
  problems of obtaining, 139
  uses of data, 138
Nativity—*see* Place of birth
Natural increase rate, formula, 197
Neonatal mortality:
  formula for rate, 191
  tabulations, 176, 181
Net reproduction rate, 197-198
Notifications:
  and improving accuracy of data, 95
  and improving registration completeness, 74
  and measuring registration completeness, 203-204
Notifier:
  defined, 70
  identity of, 71-73
Number of children born to this mother:
  definition and classification, 139-140
  problems of obtaining, 140
  tabulations based on, 175, 177, 180, 181
  uses of data, 139
Number of dependent children:
  definition and classification, 141
  problems of obtaining, 141
  tabulations, 179
  uses of data, 141
Number of previous marriages:
  definition and classification, 141
  problems of obtaining, 141
  tabulations, 182
  uses of data, 141
Occupation:
  definition and classification, 131-132, 158
  problems of obtaining, 133-134
  tabulations, 180-182
  uses of data, 129-131
Organization:
  for collection and compilation, 36-40
    agencies in charge of, 27-32
    international recommendations, 37
    types of, 36-40
  for registration, 26-36
    international recommendation, 33, 40
  of vital-statistics system, international recommendation, 40
Paper for registers and reports:
  coloured, 111, 154
  specifications for, 97, 110, 111
Penalty for failure to register, 25-26
Perinatal mortality, 142, 193
Period of gestation:
  definition and classification, 142-143
  problems of obtaining, 143
  tabulations, 177, 180, 182
  uses of data, 141

Photographic methods for:
certified copies, 100
parent notifications, 95
statistical reporting, 104, 110, 111
Place of birth:
definition and classification, 144
problems of obtaining, 144
uses of data, 143-144
Place of occurrence:
and rates, 186
as a basis of tabulation, 171-172
as place where events are registered, 77-80
definition and classification, 145
problems of obtaining, 145
relationship to "place of registration", 117-119
tabulations, 174-178, 180, 182
uses of data, 144-145
Place of registration:
effect on vital statistics, 80
international recommendation, 77
relationship to "place of occurrence", 117-119
Place of usual residence:
as a basis of tabulation, 171-172
classification, 146
definition of, 145, 172
determination of, 172
problems of obtaining, 146
tabulations, 174-182
uses of data, 145
Planning vital-statistics programme, 154-155
Plural births, 147-148
tabulations, 177
Population estimates:
for rate computation, 184-186
use of vital statistics for preparation of, 14, 15
Population registers, 14, 44
Population statistics, relation to vital statistics, 43-44, 120
Posting, 160-161
Prematurity, defined, 142, 148-149
Presentation, 162-163, 229
Preservation of records, 96-98
Pre-tabulated statistical report—*see* Summary statistical reports
Previous marital status, tabulation, 178
Principles for a Vital Statistics System, 217-229
history of, 11
recommendations:
compilation, centralized, 37, 150, 225
compilation from individual reports, 150, 225
compilation programme, goal of, 164, 225
compulsory nature of registration, 19, 220
confidentiality of registration records and statistical reports, 100, 219
control of receipt of statistical reports, 103, 155, 222
co-ordination of vital-statistics system, 40-41, 219
cost of current registration, 81, 221
cut-off date, 170-171, 225
declared events, provision for registration of, 88, 221
definition of vital events:
adoption, 63, 220
annulment, 62, 220
death, 53, 220
divorce, 62, 220
foetal death, 60, 220
legitimation, 63, 220
Principles for a Vital Statistics System
definitions of vital events (continued):
live birth, 46, 220
marriage, 60, 220
recognition, 63, 220
separation (legal), 63, 220
stillbirth, 54, 220
delayed registration, provision for, 88, 221
evaluation of the vital-statistics system, 200, 219
improvement of completeness and accuracy of data, 156, 222
improving efficiency of registrars, 68, 221
incentives to registration, 81, 220
informant, designation of legally responsible, 69, 221
organization for collection of statistical reports, 37, 102, 222
organization for compilation of national vital statistics, 37, 225
organization for registration, 33, 220
place where registration is to be made, 77, 221
registrar's registration duties, 64, 221
registrar's statistical duties, 64, 102, 110, 222
registration record, definition of items on, 96, 221
registration record, form and content, 92, 93, 95, 221
registration units, number and size of primary, 65, 220
sampling, place of in vital-statistics system, 154, 219
special surveys, place of in vital-statistics system, 155, 219
statistical report, content of, 114-115, 222-223
statistical report, definition of each item on, 120, 223-225
statistical report, form of, 104, 222
statistical reporting area, geographic and ethnic aspects, 101, 222
statistical reporting, coverage, 101, 221
tabulation area, geographic aspect, 164-165, 225
tabulation by calendar periods, 129, 225-226
tabulation by date of occurrence or date of registration, 168, 226
tabulation by place of occurrence and place of residence, 171, 226
tabulation coverage, ethnic aspect, 165, 225
tabulation programme, annual basic, 174-179, 226-228
tabulations for administration of vital-registration system, 211, 228
tabulations for local needs, 183, 228
time allowed for current registration, 83, 221
vital events on which data should be collected, 101, 219-220
vital-statistics system defined, 7-8, 218
vital-statistics system, designation of responsibilities for, 40, 219
vital-statistics system, function of, 8, 218
Priorities in data-collection programme, 114-115
Problems of obtaining data, 120-149 (*see also* under Age, Occupation, etc.)
Proof of registration, 81, 88, 100
Proportionate mortality, 192
Proportionate natality, 188
Publication programme, 162, 173
Punch-card indexes, 99
Punch-card statistical report, 104
Punching, defined, 157
Qualitative classification scheme, 157
Quality of data, evaluation of, 210-212
Quantitative classification scheme, 157
Quantity of data, evaluation of, 200-208
Querying, 38, 153, 156
Race:
definition and classification, 146
problems of obtaining, 146-147
uses of data, 146
Rate levels and evaluation of quality, 208-209
Rates (*see also* under Live birth, Death, etc.):
adjusted for age, etc., 195-196
adjustment to annual basis, 186
components of, 185-186
crude, 186
defined, 185
denominator of, 185
formulae for, 186-195, 197
numerator of, 185
population used for, 184-186
specific, 186
the constant, 186
types of, 186
Receipt of statistical reports, control of, 155
Recognition, statistical definition of, 63
Record management, 96-100
Records, vital:
accuracy and completeness of, 94-95
certified copies of, 100
confidentiality of, 100
correcting, 99-100
defined, 3-4, 90, 229
ecclesiastical origin, 3-4
filing, 98
form and content of, 93-95
history of, 3-5
indexing, 98-99
ink used, 98
items on, 95-96
paper used in, 97
preservation of, 96-97
repair of, 98
storage of, 98
uses of, 12-14
Registers, vital (*see also* Records, vital):
accuracy and completeness of, 94-95
contents, 95-96
court, 34
defined, 90, 229
definition of items, 96
ecclesiastical, 34
health department, 34
items on, 95-96
separateness of, 92-93
testing completeness of, 200-209
types, 90-92
uniformity of, 93-94
Registrant—*see* Informant
Registrars:
association of, 69
defined, 64, 229
duties and responsibilities, 64, 102, 110
identity of, 65
instruction manuals for, 68, 96, 108
methods of improving efficiency of, 67-69, 94-95, 110
number of, 65-68
qualifications, 65, 209
remuneration of, 67
status of, 67
training, 68-69, 209

Registration (registering):
agencies responsible for, 27-36
centralized vs. decentralized control of, 26-33
civil, 4, 19-25
compulsory nature of, 19-24
cost of, 80-83
dates of national legislation for, 20-24
declaration, verbal or written, 77
"declared", 88
defined, 77, 229
"delayed", 87-89
ecclesiastical, 3
enforcement of, 25-26
history of, 3-5, 19-25
incentives to, 12-13, 25-26, 35, 76, 209
organization for, 26-36
penalty for evasion of, 25-26
place of, 77-80
process of, 77-89
proof of, 81, 88, 100
responsibilities of informant in, 69-70
responsibilities of registrar in, 64
testing completeness of, 200-208
time allowed for, 83-88

Registration area—*see* Tabulation areas

Registration legislation:
elements of, 19
history of, 19-25

Registration method:
and marriage statistics, 61
defined, 5, 229
merits of, 7

Registration record—*see* Records, vital

Registration services as compilers of vital statistics, 39

Registration statistics, defined, 5

Registration units:
accessibility of, 65
international recommendation, 65
number and size of, 26, 65-66, 209

Relative numbers, 184-185

Religion:
definition and classification, 147
problems of obtaining, 147
uses of data, 147

Reporting—*see* Statistical reporting

Reproduction rates, gross and net, 197-198

Sampling:
and advance tabulations, 154-155
and control of quality, 154
and special tabulations, 155
for selection of tabulation areas, 167
place of in vital-statistics system, 154

Semanatal mortality rate, 192

Separation (legal), statistical definition of, 63

Separation factor, 201-202

Sex:
classification, 147
problems of obtaining, 147
tabulations, 175-179, 181-182
uses of data, 147

Single-unit report, 104-108
international recommendation, 104

Social-welfare statistics, relation to vital statistics, 44-45

Specific-rate formula, 186
death, 190
divorce, 195
live birth, 187-188
marriage, 194

Standard classification schemes, 158
(*see also* International Standard . . .)

Standard Form of Certificate of Cause of Death—*see* International Form of Medical Certification of Cause of Death

Standard population, 196

Statistical analysis, defined, 228

Statistical definitions (*see also* under Age, Occupation, etc.):
effect on vital statistics, 49, 52-53, 59, 61, 63
of events to be registered, 46-63
of items on statistical reports, 120-149
international recommendation, 120

Statistical processing, 150-163
advance planning, 154
classifying, 157-158
coding, 156-157
computing, 162
control of collection, 153, 155
editing, 156
error control, 161-162
posting, 160-161
presentation, 162-163
publication, 162
punching, 157
querying, 153, 156
sampling, 154-155
surveying, 155
tabulating, 158-160, 164-183
verification, 161-162

Statistical recording, defined, 229

Statistical report (*see also* Death statistical report, etc.):
accuracy and completeness of data, 110
content of, 113-119
control of receipt of, 155
defined, 101, 229
design of, 110-112
ink used on, 111
instructions for, 112
items collected nationally, 116-119
items recommended for, 113-115
layout of, 111-112
paper used for, 111
printing of, 111-112
relationship to registers, 113
size and shape of, 110
specificity of, 109-110
types (individual, list, summary), 103-108, 113, 150-154
uniformity of, 108-109

Statistical reporting, 101-103
channels of, 102-103
control of, 155
defined, 101, 229
responsibility of registrar for, 102
testing completeness of, 208-209
time schedule, 103, 155
unit of, 101

Statistical reporting area, international recommendation, 101

Statistical services as compilers of vital statistics, 37-38

Statistics, responsibilities of registrar in, 102, 110

Statistics requiring co-ordination with vital statistics:
medical, 45
migration, 44
population, 43-44
public health, 44
social welfare, 44-45

Status (as employer, employee, etc.):
definition and classification, 132-133
problems of obtaining, 133-134
tabulations, 180-181
uses of data, 129-131

Stillbirth (*see also* Foetal death):
cost of registering, 80-83
criteria for registering, 55-58
informant, 75-76
place of registration, 78-80
statistical definition of, 53-59
tabulations, 177, 182
time allowed for registering, 83-87

Stillbirth definitions:
League of Nations, 54, 59
national, 55-57, 230-236
Royal Statistical Society, 54
United Nations, 54
World Health Organization, 54

Stillbirth ratio—*see* Late foetal-death ratio

Stillbirth record, uses of, 13

Stillbirth register:
characteristics of, 90-95
items on, 96

Stillbirth registration, incompleteness of, 76

Stillbirth statistical report:
items collected, 118, Table 15
items recommended—*see* Foetal-death statistical report
types of, 105-108

Summary statistical reports, 105-108
as reporting devices, 150-152
disadvantages of, in compilation, 150-153

Surveys:
as method of obtaining vital statistics, 6-7
limitations, 7, 207
place of, in vital-statistics system, 155
use in measuring completeness of registration, 204-208

Symbols for description of tabulations, 159

Tabulations
according to date of occurrence, 168-170
according to date of registration, 168-170
by calendar period, 129, 168
by listing, 160
by place of occurrence, 171-172
by place of residence, 171-172
by tallying, 159-160
coverage, 164-167
cut-off date for, 170-171
defined, 158, 172, 229
for selected areas, 164-167
geographic reference of, 171-172
manual, 159-160
mechanical, 160
time reference of, 167-171

Tabulation areas:
as a means of improving vital statistics, 164, 204
biases in selection, 167
development of, 164-167, 204
examples of, 5-6, 165-167, 204
method of selecting units, 164-167
types of, 165-166

Tabulation programme, 158, 164-183
defined, 158, 172-173
descriptive formulae, 158-159
extended, 179-183
goal of, 164
international recommendation, 164, 173-179
time reference of, 167-171

Tabulations:
dependent on matching, 182
for administrative purposes, 144, 171, 183, 211
for evaluating quality, 210-212

Tabulations (continued)
for local needs, 183
of confinements, 177
of deaths, 175-177, 180-182
of divorces, 178-179, 182
of foetal deaths, 177, 182
of live births, 174-175, 180
of marriages, 178, 182
of stillbirths, 177, 182
Tallying, 154, 159-160
Testing completeness methods:
of registration, 200-208
of reporting, 208-209
Time allowed for current registration, 83-88 (*see also* Delayed registration)
effect on "completeness", 86-87
international recommendation, 83
"practical" period, 88
Time reference of tabulations, 167-171
Time schedule for statistical reporting, 103, 155
Total-birth order, 139-140
defined, 140
tabulations, 177, 180
Training of registrars, 68-69
international recommendation, 68, 69
Transcribing, defined, 157
Type of attendant—*see* Attendant at birth
Type of birth:
definition and classification, 148
problems of obtaining, 148
tabulations, 177
uses of data, 147-148
Type of certification—*see* Certifier
United Nations Conference on Declaration of Death of Missing Persons, 88
Unknowns as a factor in quality evaluation, 211
Urban-rural classification, 146
Uses (*see also* under Age, Occupation, etc.):
of items collected, 120-149
of vital records, 12-14
of vital statistics, 14-18
Verifying (verification), 161-162
Vital events, defined, 229
Vital rates—*see* Rates
Vital records—*see* Records, vital
Vital registration—*see* Registration
Vital statistics:
and medical statistics, 45
and migration statistics, 44
and population statistics, 43-44
and public-health statistics, 44
and social-welfare statistics, 44-45
deficiencies in, 8-9
Vital statistics (continued)
defined, 3, 229
efforts to improve, 9-11
through tabulation-area concept, 164-167
history of, 8-11
organization for compilation of, 36-40
status of, 8-9
system, defined, 7-8
uses of, 14-18
Vital-statistics methods:
analytical, 7
census, 5-6
registration, 5
surveys, 6-7
Vital-statistics programme:
and sampling, 154-155
and special surveys, 155
planning for, 154
Vital-statistics rates (*see also* Rates):
computation of 162, 184-199
estimation of, 7
Vital-statistics system:
defined, 7-8
place of sampling in, 154
Weight at birth or delivery:
definition and classification, 149
problems of obtaining, 149
tabulations, 180, 182
uses of data, 148-149
Year-of-birth tabulation, 181

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