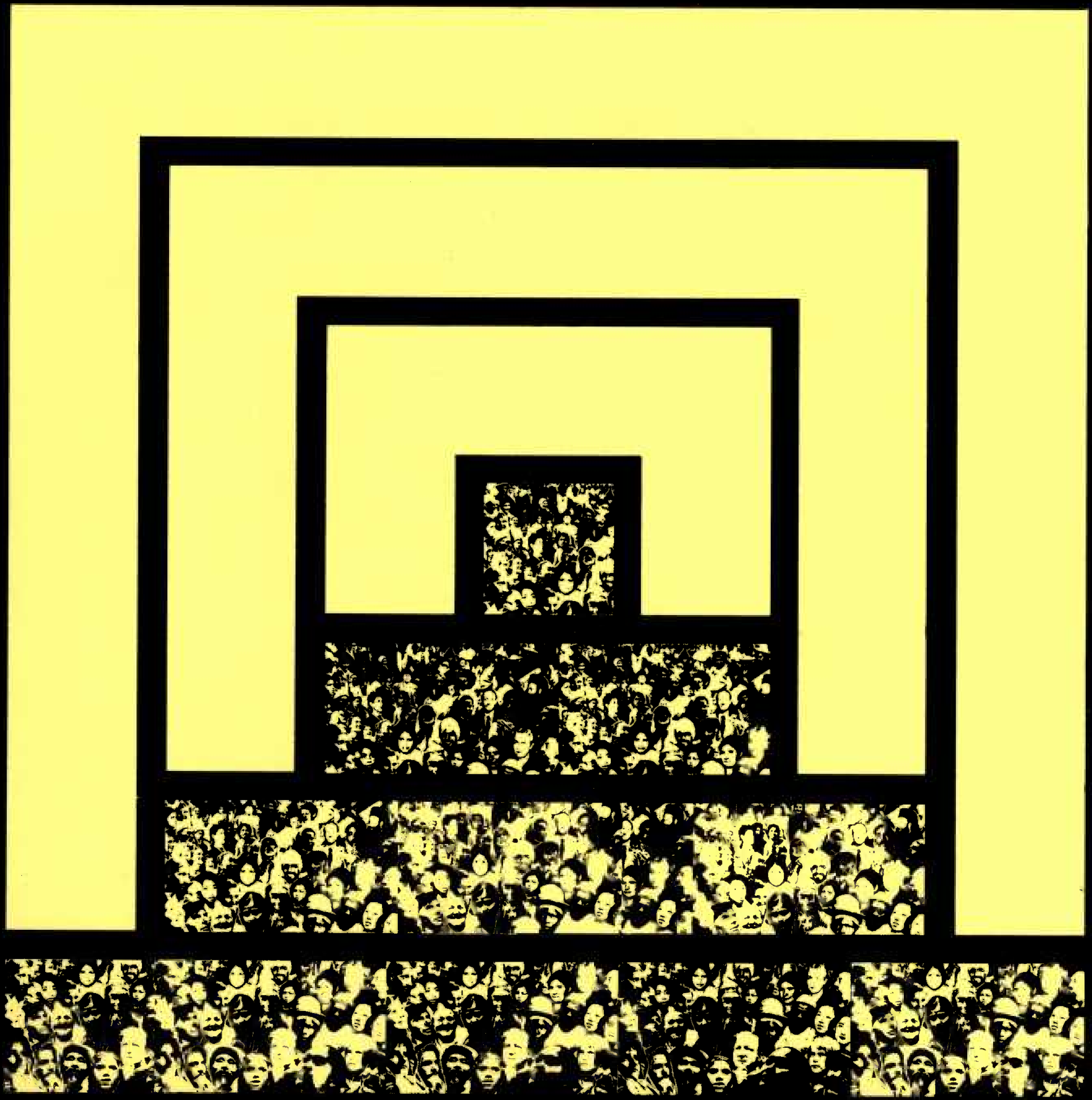
International Conference on Population, 1984

Mortality and Health Policy

Proceedings of the Expert Group on Mortality and Health Policy
Rome, 30 May to 3 June 1983



United Nations

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Department of International Economic and Social Affairs

International Conference on Population, 1984

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PREFACE

The Economic and Social Council, in its resolution 1981/87 of 25 November 1981, decided to convene an international conference on population in 1984, under the auspices of the United Nations, to be devoted to the discussion of selected issues of the highest priority, giving full recognition to the relationships between population and social and economic development with the aim of contributing to the process of review and appraisal of the World Population Plan of Action. At the request of the Council, the Secretary-General appointed the Executive Director of the United Nations Fund for Population Activities to serve as Secretary-General of the Conference and the Director of the Population Division of the Department of International Economic and Social Affairs of the United Nations Secretariat as Deputy Secretary-General.

In the same resolution, the Council authorized the Secretary-General to convene, in preparation for the Conference, four expert groups which would be interdisciplinary and concerned with the interrelationships between economic, social and political factors in population and development with a problem-solving orientation. The expert groups were therefore organized by the Population Division of the Department of International Economic and Social Affairs of the United Nations Secretariat; each of them had the central task of examining critical, high-priority population issues and, on that basis, making recommendations for action that would enhance the effectiveness of and compliance with the World Population Plan of Action. The four expert groups were: the Expert Group on Fertility and Family (New Delhi, 5-11 January 1983);the Expert Group on Population Distribution, Migration and Development (Hammamet, Tunisia, 21-25 March 1983); the Expert Group on Population, Resources, Environment and Development (Geneva, 25-29 April 1983); and the Expert Group on Mortality and Health Policy (Rome, 30 May-3 June 1983).

Contained in this volume are the report and selected papers of the Expert Group on Mortality and Health Policy, which not only will be valuable inputs to the International Conference on Population itself, but will serve as useful tools for researchers of the future in respect of mortality and health policy issues in the 1980s and of the work of the United Nations in that area.

Acknowledgements are due to the consultants and the various United Nations organizations and intergovernmental and non-governmental organizations which participated in the meeting and helped in preparing the documents.

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Part One

REPORT OF THE EXPERT GROUP ON MORTALITY AND HEALTH POLICY

INTRODUCTION

The Economic and Social Council, in its resolution 1981/87 of 25 November 1981, decided to convene an international conference on population, under the auspices of the United Nations, to be devoted to the discussion of selected issues of the highest priority, giving full recognition to the relationships between population and social and economic development, with the aim of contributing to the process of review and appraisal of the World Population Plan of Action 1/ and to its further implementation. The Council also authorized the Secretary-General to convene four expert groups as part of the preparatory activities.

Pursuant to that resolution, the Secretary-General convened the Expert Group on Mortality and Health Policy from 30 May to 3 June 1983. At the invitation of the Government of Italy, the Expert Group meeting was held at Rome. The participants included the following experts attending in their personal capacity: Lawrence A. Adeokun, University of Ife, Ile-Ife, Nigeria; Jorge Alderegufa, Instituto de Desarrollo de la Salud, Havana, Cuba; Aaron Antonovsky, Ben-Gurion University of the Negev, Beersheba, Israel; Hugo Behm, Centro Latinoamericano de Demografía (CELADE) Subsede, San José, Costa Rica; Anne-Marie Bolander, Statistics Sweden, Stockholm, Sweden; John C. Caldwell, The Australian National University, Canberra, Australia; Stan D'Souza, International Centre for Diarrhoeal Disease Research, Dacca, Bangladesh; Nora Federici, Rome, Italy; Péter Józan, Hungarian Central Statistical Office, Budapest, Hungary; Borbor S. Kandeh, Njala University College, Freetown, Sierra Leone; Henry Mosley, Ford Foundation, Jakarta, Indonesia; Minoru Muramatsu, Institute of Public Health, Tokyo, Japan; Alberto Palloni, University of Wisconsin, Madison, Wisconsin, United States; Samuel H. Preston, University of Pennsylvania, Philadelphia, Pennsylvania, United States; and Jacques Vallin, Institut National d'Etudes Démographiques, Paris, France.

The participants also included Rafael Salas and Léon Tabah, Secretary-General and Deputy Secretary-General, respectively, of the International Conference on Population, 1984; representatives of the Population Division of the Department of International Economic and Social Affairs of the United Nations Secretariat; representatives of the following regional commissions of the United Nations: the Economic Commission for Europe, the Economic and Social Commission for Asia and the Pacific, the Economic Commission for Latin America, the Economic Commission for Africa and the Economic Commission for Western Asia; representatives of the following United Nations bodies: the United Nations Children's Fund and the United Nations Fund for Population Activities; representatives of the following specialized agencies: the Food and Agriculture Organization of the United Nations and the World Bank; a representative of the Organization for Economic Co-operation and Development, an intergovernmental organization; and representatives of the following non-governmental organizations: the International Planned Parenthood Federation, the International Statistical Institute/World Fertility Survey, the Population Council, the Population Institute, the International Social Security Association, the International Union for the Scientific Study of Population, the Sahel Institute, the Committee for International Co-operation in National Research in Demography, and the Opera Pia International. There were also three observers.

The participants represented a broad range of geographical regions, scientific disciplines and institutions concerned with questions of mortality and health policy.

To provide a basis for discussion, a background document was prepared by the Department of International Economic and Social Affairs of the United Nations Secretariat. That document (Part Two, chap. I.A of the present paper) was entitled "Mortality and health policy: highlights of the issues in the context of the World Population Plan of Action", and provided an overview of the topics for discussion corresponding to the substantive items of the agenda as follows: (a) progress and prospects for mortality reduction; (b) interactions between health, mortality and development; (c) health policies and their effects on mortality; and (d) implementation of health policies. Other background papers were provided by the Department of Technical Co-operation for Development of the United Nations Secretariat, the United Nations Fund for Population Activities, several regional commissions and specialized agencies, the Committee for International Co-operation in National Research in Demography, the International Social Security Association, and the International Statistical Institute/World Fertility Survey. 2/

Special acknowledgement is due to the International Union for the Scientific Study of Population and to its Committee on Factors Affecting Mortality and the Length of Life for allowing the United Nations to reproduce several papers and draw on the discussions at the Seminar on Social Policy, Health Policy and Mortality Prospects, held in Paris on 28 February-4 March 1983.

Welcoming remarks were made by Aldo Aiello, Member of the Italian Parliament, Sergio Silvio Balanzino, representing the Italian Ministry of Foreign Affairs, and Giovanni Spinelli, on behalf of the Mayor of Rome. In his statement, Rafael M. Salas, Secretary-General of the International Conference on Population, 1984, and Executive Director of the United Nations Fund for Population Activities, noted that reduction of premature mortality should be a primary concern of Governments and that it was essential to find ways of translating such government concern into effective action. He further emphasized that the reduction of premature mortality was both a humanitarian concern and an important aspect of the question whether and how development was to be achieved. In his introductory remarks, Léon Tabah, Deputy Secretary-General of the International Conference and Director of the Population Division of the Department of International Economic and Social Affairs, indicated that the objective of all government policy was to increase the length of life and improve its quality. He also emphasized that health policy must be considered part and parcel of development policy as health was not the affair of the health sector alone.

The central task of the Expert Group meeting was to examine critical, high-priority issues relevant to mortality and health and, on the basis of the deliberations, to make recommendations for action by Governments and international and non-governmental agencies that would enhance the effectiveness of and compliance with the World Population Plan of Action. The views of the experts at the meeting were expressed in their individual capacities and did not represent the views of the Governments of their countries.

I. PROGRESS AND PROSPECTS FOR MORTALITY REDUCTION

The World Population Plan of Action set as a target for the countries with the highest mortality rates the achievement of an expectation of life at birth of at least 50 years and an infant mortality rate of less than 120 per thousand live births by 1985. It also noted the progress that would be necessary for each region - and hence the world as a whole - to attain an average life expectancy of 62 years by 1985 and 74 years by 2000. The Expert Group noted the progress towards the latter figures made in the past decade. For 1985 life expectancy at birth was expected to be about 60 years world-wide, still two years below the figure indicated in the Plan of Action. However, this aggregate figure disguised the fact that a number of individual countries, in addition to two major regions - Africa and South Asia - would fail to attain this figure. The participants stressed the mixed progress of the highest mortality countries in reaching the established minimum targets. By 1985 the goals for life expectancy would not have been reached by 22 countries and for infant mortality by 26 countries; all those countries were in the regions of Africa or South Asia and had a combined population of 150 million.

The discussion indicated the many factors restraining mortality decline in the highest mortality countries, including development strategies that de-emphasized the production of basic foodstuffs; structures of health services not suitably adapted to local conditions; low priority for health issues within development plans and budgets; absence of significant international aid for health; urban-biased styles of development; absence of appropriate health technologies; and high debt-service burdens that prevented the importation of needed medical supplies.

The continuing high mortality in many developing countries brought home to the participants the necessity of restating mortality goals for developing countries in a revision of the Plan of Action. There was general consensus that targets should be set not only for the higher mortality countries but also for countries which had achieved intermediate or lower levels of mortality: such goals would give added impetus to their mortality reduction programmes. The Expert Group stated that targets should also be considered for child mortality and maternal mortality, or for specific regions. The participants agreed that all targets should be measurable and feasible.

The participants noted that the developed countries had also followed divergent paths in mortality. In most but not all countries mortality declines in the past decade had probably exceeded expectations, as unanticipated declines in cardio-vascular mortality had often occurred among adults, and infant mortality had been reduced below a level that until recently had been thought to be an irreducible minimum. Several countries, however, had witnessed a deterioration in mortality conditions, especially for males. Deleterious personal health habits might be implicated in this trend.

The discussion reverted several times to the question of significant differential mortality, in both developing and developed countries. The desirability of setting goals for reduction of differentials, as well as for overall mortality levels, was discussed since, when some population groups suffered much higher mortality, the mortality condition of the country as a whole could not be considered satisfactory, even if national targets had been achieved. Mortality improvement was seen as the responsibility of international as well as national authorities.

Many participants noted that mortality data in their countries or regions were seriously inadequate for formulating programmes. The ability to develop policies to achieve goals was thus hampered. It was observed that accurate mortality data were required not only to establish levels and trends in mortality and monitor progress towards goals but also to identify causal factors that could aid in programme formulation.

II. INTERACTIONS BETWEEN HEALTH, MORTALITY AND DEVELOPMENT

Since the goal of development was to advance the welfare and well-being of populations, and improved levels of health and longevity were probably the single most highly valued components of this goal, the Expert Group expressed the opinion that viewpoints which separated the concepts of health and development were artificial and perhaps even dangerous in that they might have been responsible for reductions in international aid in the area of health and might have imposed a serious distortion in the setting of developmental priorities.

The relations between health and mortality and other components of the development process were discussed. It was agreed that there were several important routes by which health improvement and mortality decline could foster other features of the development process. Economists had found that among the most important sources of economic growth were improvements in labour quality and in the stock of knowledge and technology. Clearly, improved levels of health contributed to improved quality of labour and increased incentives to make human investments.

The improved longevity and health achieved by the developing countries was not considered to be necessarily permanent. It was noted that developing countries were particularly vulnerable to climatic changes that altered the production of crops and to the vagaries of the international political and economic climate. The Sahelian drought and Bangladesh famine of the early 1970s stood as vivid reminders of the possibility of serious setbacks on the road to improved health.

At the same time, it was recognized that mortality declines in developed countries were now contributing to the aging of populations and that such a trend had consequences for health patterns and social support systems. Nevertheless, aging was positive in the sense that it reflected attainment of a universally valued goal. Concurring with the International Plan of Action on Aging, 3/ the participants noted the important contributions to society made by the elderly and expressed the view that Governments should anticipate and strive to accommodate, in a timely and humane fashion, the changes induced by population aging.

Economic development and socio-cultural modernization were not seen as bringing only benefits to the health of a society. Changes in life-styles, environmental deterioration and hazardous industrial working conditions, often concomitant with development, had negative consequences; these consequences should be anticipated and attempts should be made to counteract them.

Since all peoples' endeavours to improve the length and quality of their lives were hampered by wars and allocation of resources towards armaments and away from social needs, the participants stressed the importance of peaceful relations among countries.

The Expert Group noted the persistence of significant mortality differentials and their relationship to social and economic inequalities. The Group further indicated that mortality differentials sometimes simply reflected the ability of one group to escape the very poor conditions of society and that those differentials therefore pointed the way towards progress that might be possible for all. It was concluded that a policy explicitly aimed at upgrading the conditions of the very poorest groups had proved to be a development strategy with very beneficial effects on health for those groups and for the population as a whole.

The Expert Group considered the effects of other components of the development process on health and mortality. Levels of per capita national income were strongly associated with mortality levels, pointing out the role of general economic advance in mortality improvement. However, at a given level of economic affluence, there was considerable scope for influencing mortality through policies in the social and health arena. Some countries were "super-achievers" in the health domain, far outpacing the typical performance of other countries at their income levels. All of these "super-achievers" had stimulated widespread popular participation in the health sector and in the development process.

It was pointed out that among the social policies with greatest effects on health and mortality were those related to education. Evidence was reviewed showing that the level of maternal education in developing countries was a decisive determinant of child mortality levels. The evidence drew attention away from strictly economic factors to the important role of child care and distribution of resources within the family. When women were the first-level health care providers, their activities and attitudes influenced the health of all family members. The mechanism through which maternal education could affect mortality included a heightened perception of health problems and an increased sense of one's capacity to solve the problem. Better maternal education might also create better knowledge of positive health and sanitary practices and change the relative status of women in the household. The provision of education might also stimulate the expectations for better health. Finally, it was noted that improved maternal education could reduce child mortality by changing patterns of childbearing. Whatever the mechanism of the relation, the close connection between maternal schooling and child mortality afforded one of the most promising means for influencing child mortality. This was an area where programmes in one sector almost certainly produced major advances in another sector.

The Expert Group observed that women's own health could also be directly advanced through programmes to reduce maternal mortality. It expressed the conviction that female circumcision was a health-threatening operation that should be ended where it existed.

It was indicated that, in the light of the importance of overall social and economic development for health improvement, an effective effort to improve health status would require the co-operation of a wide range of international organizations. It was no longer satisfactory to reserve health concerns for the international organizations traditionally involved. Efforts would be needed to induce other organizations to adopt a more active concern for the health implications of their activities.

III. HEALTH AND SOCIAL POLICIES AND THEIR EFFECTS ON MORTALITY: DEVELOPING COUNTRIES

It was agreed that the adoption and implementation of health policies and the promotion of healthy conditions was central to the attainment of good health and long life. A healthy milieu was necessarily characterized by high national levels of life expectancy and low levels of morbidity. Important intermediate goals were: affordable access to health care for all segments of the population, active community participation, and the realization by individuals that early death and ill health were not inevitable but, rather, that a long and healthy life was within the individual's and family's ability to attain and human right to demand.

The Expert Group identified five major themes to be considered when establishing health policies in developing countries: having the necessary data upon which to determine the appropriate health policy; establishing a conceptual framework to set health priorities and to allocate resources; ascertaining appropriate health and social interventions; considering the financial, administrative and cultural context in which health policies must be implemented; and activating the political will of Governments to focus scarce resources and attention on health matters.

A. Data bases

It was the view that among the most fundamental requirements for the planning, implementation and evaluation of a successful programme of health and social interventions were an understanding of the structure and distribution of morbidity and mortality within the country, information on the economic and social context and cultural patterns underlying the mortality structure, knowledge of the potential efficacy of various health and social intervention strategies, and an understanding of the community cultural and behaviour patterns which might condition acceptance of the interventions. The Expert Group regretted that this data base of necessary background material for establishing health policies was non-existent in many developing countries.

It was the consensus of the Expert Group that the widespread need for information on three levels - small group anthropological studies of acceptance of health practices, national studies of mortality and morbidity patterns, and regional studies of the efficacy of health and social strategies - pointed to the advantages of a co-ordinated world-wide programme to study mortality and morbidity. Such a programme would provide a clearing house for information exchange and, more importantly, a central organization through which technical survey and substantive expertise could be exchanged, assistance could be provided for national research and data collection activities and international research could be organized. Such a programme would encourage efficient use of the often small amount of resources available for health and mortality issues.

Stress was repeatedly laid on the overriding importance of effective programme evaluation, for which good data were obviously essential. Too often administrators viewed success in programmatic terms - for example, services delivered - rather than in terms of the impact on the ultimate targets, disease and death. Furthermore, a well-evaluated programme had benefits extending far beyond the project area. The Expert Group emphasized the importance of including in evaluation activities the necessary resources and expertise for data processing.

B. Conceptual framework for setting health priorities

The Group indicated that the design, selection and execution of health policies required the existence of an explicit and comprehensive conceptual framework reflecting the various mechanisms affecting health conditions and mortality. Such a framework should exhibit the role of the numerous proximate and background determinants and individual and community characteristics in health and mortality. The chain of events leading from healthy status to disease and eventual recovery or death might be quite lengthy and complicated, and the participants concurred that the framework must therefore recognize both social and biological synergisms with health and mortality. In many cases, sustained health improvement or mortality reduction could be attained only by attacking the underlying factors at their source, a source which at first glance might seem to have little relevance to health sector activities. For example, storage of water in pottery jars large enough for mosquitoes to set their eggs in could lead to malaria transmission even far from the usual river beds or lakes. Introduction of piped water or a change in water storage practices might be a more efficient means for malaria control under these circumstances than prophylaxis or spraying.

C. Efficacy of health and social interventions

The Expert Group recognized the interdependence and mutually supportive role of advances in different sectors for reducing mortality. Participants endorsed the primary health care movement and the Declaration of Alma Ata. 4/ Basic to this concept was the adaptation of health services to people's needs.

The participants recognized the importance to primary health care of simple preventive measures spread throughout the population. Vaccination against specific diseases represented one of the most effective available disease-prevention techniques. Neonatal tetanus, pertussis and measles often contributed significantly to infant and child mortality and could be largely prevented by immunization. It was agreed that in most developing countries these diseases remained serious problems because of the low coverage of the population by vaccines. Oral rehydration therapies (a combination of treatment and prevention) also appeared effective in containing the damage done by diarrhoeal disease, with minimum demands on health personnel and facilities required for other tasks. However, the evidence was inconclusive on the population effectiveness of oral rehydration in large populations where intensive instruction was not possible. Encouragement of good feeding practices, especially regarding breast-feeding, was a promising component of primary health care programmes. Nutritional supplementation campaigns were also sometimes added to these programmes, although their effectiveness among large population groups, and among other than the most malnourished populations, remained to be established. Pre-natal and post-natal care, including family planning, could improve the health of mother and child as well as provide a setting for instruction on healthy child-rearing practices and on the recognition of diseases and procedures for dealing with them. Primary health care programmes could also include an important curative element, such as the administration of antibiotics. An unsanitary environment was an enormously important cause of ill health and premature death in most developing countries. The burden of infection resulting from such an environment was one of the major reasons for poor physical growth of children, which in turn had very serious mortality implications. The Expert Group agreed that clean water and satisfactory sewage disposal were important ingredients in the development process and should be phased in at the earliest stage permitted by economic considerations.

It was pointed out that anti-malarial activities were an additional important health measure. Especially in Africa, malaria remained an extremely serious contributor to morbidity and to mortality from many causes.

The Expert Group noted that primary health care programmes had often been carried out in ways discordant with the provisions of the Declaration of Alma Ata. There had often been insufficient attention to the need for community support and participation in launching, maintaining and upgrading such programmes. The medical community, when oriented towards expensive urban-based curative services based on the Western model, might also prove to be a stumbling block.

Approaches that relied on technological measures without adequate attention to the need for personal behavioural changes were sharply criticized. It was also argued that there was a need for relevant, simple, appropriate technologies to support behavioural changes.

D. Context of health and social interventions

It was noted that appropriate health policies were specific to a population group's cultural and social setting and must be established within national contexts and national constraints. The design of social and health policies should take into consideration two sets of constraints: first, that isolated interventions could prevent certain morbid conditions without supressing other equally or more deleterious ones; and secondly, that social and health programmes took place within a social context that imposed restrictions not only of an economic order but also, and perhaps more importantly, of a cultural order. Beliefs and behaviours might impair the efficient implementation of interventions. More importance had to be given to tailoring specific interventions to specific cultural contexts.

It was repeatedly stressed that health programmes should not be exclusively focused on the use of therapeutic agents but should recognize the social/cultural and economic context of disease and premature death. Sometimes these social causes were much more susceptible to change than were biochemical balances. On a larger scale, it was stressed that health programmes such as primary health care should not be seen as a substitute for social and economic development but, rather, as working in concert with such development to achieve valued social objectives.

E. Political will

The Group reviewed the experience of some countries which, in spite of critical constraints, had achieved considerable improvements in the health conditions of their population. In this regard, the Group recognized that such notable successes were due mainly to a strong political commitment. In fact, the implementation of social and health policies required the mobilization of political action and political will. Whether or not such mobilization took place efficiently would depend on several conditions. One of those conditions was the particular positions, alliances and strategies of the élites of the countries and the degree to which they were influenced by the population as a whole. Another, more obvious, condition was the share of available resources allocated for social needs in these countries. These limitations were very much influenced by the particular position of the country vis-à-vis the international system.

IV. HEALTH AND SOCIAL POLICIES AND THEIR EFFECTS ON MORTALITY: DEVELOPED COUNTRIES

The participants indicated that the conditions in developed countries differ from those in developing countries in several respects. Because populations were much older and mortality from communicable diseases was very low, the chronic degenerative diseases were the principal concern. The latter were very serious sources of morbidity as well as of mortality; in fact, problems associated with prolonged chronic illnesses had become of major importance. Despite these distinctions, many of the problems were shared by developing countries, at least in urban areas, and would become more common in some developing countries over the next decade.

The likelihood that many of the most serious health problems in developed countries could be reduced by changes in personal health practices was recognized throughout the discussion. These practices included such life-style characteristics as cigarette smoking, lack of exercise, excessive alcohol consumption and poor dietary practice. They also included driving after alcohol consumption and failure to take simple precautionary measures such as the use of seat belts. The participants recognized that life-style behaviour often had an important socio-psychological basis that was usually poorly understood. Studies of these relationships were necessary in order to construct effective interventions. At a minimum, according to the participants, it was necessary to disseminate widely information about the very serious consequences of such behaviour patterns so that people could act on the basis of full information. Campaigns of persuasion might also be mounted. Aggressive promotion of healthy life styles was clearly a high priority for health programmes.

The participants also discussed the value of early detection of chronic diseases. Mass screening programmes to detect preclinical disease were believed to be useful for several chronic diseases. Early detection might improve survival in certain types of cancer and reduce the costs of treatment. It was noted that there had been very few appropriate studies to see whether mortality in the screened was lower than in the unscreened. Mass screening for lung, colon and bladder cancer was very expensive and of dubious value.

It was noted that in some countries where measures had been taken to make available widespread health care marked differentials persisted according to social strata. Evidence on time trends in such differentials was limited to a few countries; in those countries, relative differentials had not narrowed. The causes of this trend were unclear and deserved study. For example, carefully crafted comparative studies of health care systems - e.g., private versus public - could shed light on the most efficient means to extend quality and coverage of programmes and, as a result, to reduce levels and differentials in mortality. However, the Group recognized that mortality levels and differentials were largely determined by policies and programmes not directly the responsibility of the health sector. They were determined by many social, economic, and cultural influences, thus underlining the importance of intersectoral collaboration and the development of mutually supportive and coherent strategies. The way of dealing with long-term illness, for example, could influence and be influenced by the availability of housing for the elderly, an issue complicated by radical changes in family patterns and family support systems. The participants were alarmed by the widening sex differentials in mortality in more developed countries and indicated that life-style behaviours, industrial hazards and pollution might all be taking a large toll on the male sex.

New approaches for studying mortality differentials were also needed, the participants indicated. In several countries, ingenious schemes for following up samples of the population had been introduced so that life histories could be reconstructed. This approach offered promising avenues not only for mortality research but also for a wide spectrum of social policy. Such an approach contained, inter alia, an essential step towards overcoming some of the major methodological obstacles to assessing the evolution of differential mortality over a period of time. It also provided possibilities for understanding the underlying reasons for deleterious individual-level behaviour patterns, particularly in relation to mental stress and emotional disturbances in everyday life. The Group noted that this approach would be useful also for studying differentials by sex.

V. IMPLEMENTATION OF MORTALITY REDUCTION AND HEALTH PROGRAMMES AND INTERNATIONAL CO-OPERATION

The Expert Group considered the factors which facilitated or hampered the implementation of health policies and indicated that knowledge was limited owing to the insufficient research and evaluation efforts built into health programmes. However, on the basis of the limited evidence available, the participants emphasized the following points in their discussions.

The successful implementation of health programmes was contingent upon the degree of commitment to the value of health improvement by those who held or influenced power and determined the allocation of resources. The achievement of health improvement would depend not only upon the commitment of those persons and national bodies but also upon the willingness of the international community to accept its full share of responsibility for supporting and encouraging efforts to lower mortality.

A health programme was more likely to be successfully implemented if it was considered in the context of other development programmes. Planners must be conversant with, sensitive to and in contact with those working in other sectors. In that way conflict and superfluous action could be avoided and the health implications of development programmes could be considered and perhaps incorporated into development projects.

The Expert Group emphasized the importance of programme commitment by the personnel carrying out the programme and by the population it served. This in turn suggested the possibility and value of the overlapping of personnel and clients. Commitment was likely to be enhanced when these were the same persons or members of the same group or community.

The Group noted that policy formulation without regard to limitation of resources could be self-defeating. When it was clear that resources in political support, material, funds, personnel or infrastructure would not be available, the first stage should be to marshal those resources before executing the project. The participants emphasized that that did not mean that health planners should not question the overall allocation of resources and seek support throughout the society for increased allocation to health.

Even when the necessary commitment, co-ordination and resources were available, the Expert Group noted that successful implementation of mortality-reduction and health programmes was often hampered by mistakes in their very formulation. Often the appropriateness of the programme and its cost-benefit implications had not been clearly studied, interim and long-range targets had not been specified, and necessary monitoring devices had not been built in. Programmes had often been begun without the knowledge that in another country the very same programme had been undertaken and had failed (or succeeded). Internal and international communication and familiarity with accumulated research and knowledge were essential at the planning stage.

The participants also noted that past programme formulation had often been dominated by what was termed the "blueprint" approach. Detailed, long-range blueprints were formulated, often by international organizations and top-level experts distant from the local scenes in which the project was to be carried out and unfamiliar with and untrained in the realities of the field. This approach dispensed with grass-roots involvement in planning and implementation; such a lack of community participation was often followed by lack of local commitment. The blueprint might lead to inflexibility. Even when interim evaluation was built in - and that was not always the case - it might be difficult to make significant changes, particularly if they affected vested interests. The Expert Group emphasized that the programme formulation should take a "learning process approach", by which overall goals were determined and resources specified in co-operation with the local community; such an approach included local monitoring and built in the possibility of change. Even with the learning process approach it was necessary *a priori* to prepare relatively detailed plans. The major advantage was that local commitment was enhanced and, through continuous monitoring and evaluation, the operational structure allowed for the flexibility to alter plans, correct mistakes, incorporate new techniques and respond to altered circumstances.

It was noted that programmes were often formulated within the mould of curative medicine and run by those who had long lived within that mould - very often physicians. Curative care was provided through capital investment structures in urban centres. High-level technology, highly skilled personnel and grand-scale building formed the nucleus of health policies and, not surprisingly, the component systems of such policies had little measurable impact upon the mortality levels and health status of populations. When planning did not include community participation and was undertaken by capital city residents trained in developed country situations, the formation of a technology-based philosophy could be expected - a philosophy corresponding to their experiences and environment: well-to-do, urban civil servants whose illnesses and disease patterns were best served by the hospital-based, doctor-intensive health framework. But, the participants stressed, this approach often served very poorly the bulk of the population, which lived in rural areas and in environments necessitating a preventive health care emphasis.

The Expert Group recognized the impeding role sometimes played by vested interests on the international level. The pharmaceutical industry and other multinational corporations had abetted the turning of scarce resources away from community needs and towards purchase of their own products, which might have minimum relevance to the needs of the less developed countries.

Ironically, the basic technological knowledge and techniques - drugs, nutrition, electronics, etc. - that they offered had great potential value for improving the health of the population of those countries as a supplement to a community-based health programme. The Expert Group indicated that international organizations had an important function for providing explicit standards, proposing codes of conduct and monitoring compliance in marketing and distribution of products.

It was noted that many health programmes had been bedevilled by elementary mismanagement, sheer inefficiency and, unfortunately, corruption. These were universal problems and varied only in their intensity. What could keep them in check was the integration of monitoring and evaluation procedures.

The participants discussed the important role of international co-operation in mortality reduction programmes, pointing out the moral responsibility of the international community to encourage and support countries in improving health and lengthening life among all population groups. The Group indicated that international organizations should strive to better co-ordinate projects in their fields of activity in order to ensure that health aspects were fully considered in their projects and in all aspects of development progress in a balanced manner. Specifically, the Group emphasized that the international organizations and donor countries and agencies should ensure that adequate resources were available for research and action programmes to formulate, implement and monitor appropriate and cost-effective health programmes.

Finally, the Expert Group stressed the fundamental value of a social climate in which large numbers of people recognized their human right to be well informed about health matters and had the power to demand that their health needs be met. In situations where such a social climate had prevailed, considerable advances had occurred in the health and well-being of people throughout the society.

VI. RECOMMENDATIONS

The Expert Group reiterated the full validity of the principles and objectives of the World Population Plan of Action. Following intensive discussions of the state of knowledge about progress and prospects for mortality reduction, interactions between health, mortality and development, health and social policies and their effects on mortality, and implementation of health policies and technical co-operation, the Expert Group recommended a variety of actions that, in its view, would lead towards the further implementation of the objectives specified in the Plan of Action. The preamble read as follows:

> The improvement of health and the reduction of mortality is a central goal of development, since a long and healthy life is the single greatest gift that an individual can have. It also facilitates other aspects of development because ill-health and volatile mortality at younger ages

disrupt all other development activities. High levels of morbidity and mortality underlie low work inputs, limited planning horizons and many other characteristics usually described under the rubric of underdevelopment.

The ultimate goal of population activities is to improve the well-being of individuals and their families. High levels of mortality threaten the survival of many families because of the considerable chance of losing one or more children or a primary provider. A reduction of mortality speeds completion of the demographic transition since reduced infant and childhood mortality is likely to have a moderating effect on fertility levels. The attainment of low levels of fertility and of population growth may not be possible without the investment of greatly increased efforts and funding for the reduction of mortality.

The Expert Group endorses the goal of health for all by the year 2000 as adopted in 1977 by the Thirtieth World Health Assembly and endorses the concept of primary health care as expressed in the Declaration of Alma Ata in 1978.

A. General

(1) Since Governments have indicated in international forums, through resolutions of the General Assembly and through United Nations population inquiries that at the national and sub-national levels mortality and health conditions are not acceptable, efforts to bring about more rapid declines in mortality and more rapid improvements in health should be greatly intensified and accorded a much higher priority than at present.

(2) In view of the central role of personal behaviour in health improvement, individuals and families should be provided, as a basic human right, with all information and resources necessary for them to control their own health situations.

(3) Since the goal of health for all by the year 2000 would be seriously hampered by wars and by the high expenditures on arms, national and international organizations should accord the highest priority to fostering improved international relations, thereby making possible a reallocation of funds from military expenditures to programmes in the social and economic spheres.

B. Goals

(4) The International Conference on Population should set new goals for mortality reduction. The revised targets should be feasible, verifiable and consistent with current levels and prospective trends of mortality. Achievement of such goals is not only the responsibility of individual

countries, but a collective responsibility of the international community. Targets should be explicit and quantitative, stated in terms such as an expectation of life at birth of at least 60 years and an infant mortality rate of less than 70 infant deaths per 1,000 live births by the year 2000 for the countries with the highest mortality rates.

(5) The International Conference on Population should consider setting targets specific to separate regions or specific to groups of countries that are currently at higher, intermediate or lower levels of mortality. In addition, consideration should be given to goals for childhood and maternal mortality.

(6) The United Nations, the World Health Organization and other international organizations should continue to monitor levels, trends and differentials in mortality, as appropriate to their respective mandates, as an aid to countries in evaluating the success of programmes in achieving their goals for mortality reduction.

C. Health and development

(7) Since national and international policies relating to all sectors of society can influence health, and since improved health, especially through the mechanism of improved physical and mental capabilities, affects the success of development projects:

(a) The promotion and preservation of good health should be the explicit concern of all levels and branches of government, according to their main functions;

(b) Government actions in the area of mortality and health should be co-ordinated with actions in other development and social sectors and, as part of that co-ordination, development programmes should be monitored and analysed to assess their health impact;

(c) Special attention should be paid to health on the agendas of national and international development agencies; they should not be limited merely to the programmes of those agencies traditionally concerned.

(8) In planning development strategies, Governments should strive towards initiating projects which equitably enhance health.

(9) In order to contribute most effectively to health improvement as well as general well-being, government programmes should be oriented increasingly towards the development of "human resources".

(10) Because formal maternal education influences family health and community development and because of the demonstrable link between maternal education and the survival of children, schooling for all girls should be a top priority in social development. Moreover, as there is usually a time-lag

between the end of school attendance and motherhood, and as many women are now illiterate, a supplementary effort should be made to extend adult female mass education programmes, including, for example, emphasis on basic literacy and good hygiene and nutrition practices.

(11) In order to attain the objective of health for all by the year 2000, Governments are urged, as a first priority, to direct available health resources, on a multisectorial basis, towards the most vulnerable groups, especially those in the most impoverished social categories.

(12) Since progress to reduce mortality rates and improve health in many developing countries is impeded by the dependent economic relationship of many developing countries with the developed countries, as well as by the lack of the necessary political will within the developing countries themselves, a firm assertion should be made in all appropriate international forums of the high price, in terms of human lives, of such unjust and inequitable international relations and of inadequate governmental commitment to improving the health of populations.

(13) As the period 1981-1990 is the International Drinking Water Supply and Sanitation Decade, and in view of the known health and mortality effects of poor water supply and inadequate drainage, provision of clean potable water and regulated waste disposal should be an urgent priority of all Governments.

(14) Because of the evidence linking inadequate housing with poor health and high mortality, efforts should be made to improve urban and rural housing as soon as possible.

(15) Because of their effects on health and mortality, every effort should be made to reduce pollution and other environmental damages.

(16) As the characteristics of many occupations in the modern sector of economies have negative consequences for mortality and morbidity, owing to stress and other hazardous working conditions, necessary preventive actions should be taken. Because these conditions affect the health not only of women participating in the labour force but also indirectly that of their children, particular attention should be given to the working conditions of women.

D. Health and social policies and programmes

(17) Those Governments whose economic and social development plans and national budgets currently place relatively little emphasis on the health sector should give higher priority to health programmes in both budgets and development plans.

(18) National health systems should be oriented towards the goal of improving the health of all population groups within a country. The Expert Group confirms the Declaration of Alma Ata as a means of carrying out this goal, especially through the development and delivery of appropriate technologies that cover all the population and that effectively involve all of the people concerned.

(19) During education and training of personnel for implementation of health programmes, the importance of humane attitudes and behaviour should be emphasized.

(20) Since many life-style characteristics, such as tobacco, alcohol and drug consumption, inadequate or inappropriate diet and lack of exercise, have detrimental effects on health and lead to premature death, countries should initiate or strengthen preventive action programmes to influence life styles, especially through education and mass media.

(21) For both infectious and non-infectious diseases, medical practice should be more oriented towards prevention. A reorientation towards preventive programmes would also allow for substantial economies in health expenditure.

(22) As evaluation greatly enhances the value of a programme not only for future activities in the country but also for other countries, special attention should be given to the evaluation of the impacts of specific health, social and other interventions for reducing mortality and morbidity, as well as to determining the cost-effectiveness of such interventions.

(23) Efforts should be made to promote and support breast-feeding and to disseminate throughout the population information on its role in reducing infant morbidity and mortality. Emphasis should also be placed upon providing clean and nutritious supplementary feeding in a timely fashion.

(24) Because of the strong relationship within the most malnourished populations between maternal malnutrition and low birth weight of infants - with subsequent high neonatal mortality - special emphasis should be given to maternal nutrition programmes for those populations.

(25) Countries that have not already done so are urged to establish a national list of essential drugs and to ensure the permanent availability of those drugs at all levels of the health care system.

(26) Appropriate United Nations agencies should provide support to the Governments of those countries where circumcision of young girls is a continuing practice, as part of national efforts to prevent practices that lead to illness and death.

E. Mortality and reproductive behaviour

(27) Because fertility regulation is one of the most effective ways of preventing high-risk pregnancies, and hence of reducing perinatal, infant and maternal mortality and morbidity, family planning should be promoted as an important health measure in all maternal and child health programmes. The recommendations of the Expert Group on Fertility and Family 5/ should be considered in conjunction with the recommendations of the Expert Group on Mortality and Health Policy.

(28) Possible short-term and long-term health risks associated with methods of fertility regulation should be carefully monitored, assessed and evaluated within each country's special context.

(29) Relevant national and international agencies should make special efforts to reduce involuntary infertility and subfertility, as well as unwanted births with the attendant risks of illegal abortion.

(30) All efforts should be made to reduce maternal mortality and morbidity with the least possible delay. When culturally acceptable, every woman should be attended during pregnancy and during labour by a traied practitioner.

F. Data collection and research

(31) Because information on levels, trends and differentials in mortality, causes of death, and morbidity is necessary for the formulation, implementation and evaluation of health and social development policies, national Governments should create new, or strengthen existing, systems of data collection and processing and make use of and improve the quality of all available sources of information.

(32) As the regular reporting to the World Health Organization and other bodies by all countries of information on selected diseases of major concern is essential for disease control within and among countries, measures should be taken to ensure accuracy and continuity in such reports.

(33) Information on levels, trends and differentials in mortality among adults is much less abundant than that concerning infants and children, and special emphasis should therefore be placed on data collection and research for adult ages.

(34) A co-ordinated international data collection and research programme on health and mortality should be established. The programme should have a substantial degree of independence from existing institutions in order to maximize its adaptability and ability to undertake initiatives. The focus of the programme's work should be on the levels and trends of health, morbidity and mortality, the determinants of morbidity and mortality levels, mortality differentials, and the causes of changes in those levels, with particular emphasis on policy interventions which might stimulate desired change. The programme should attempt to foster standardization of concepts and should provide upon request guidance on data collection, processing and analysis.

(35) There should be research on the effectiveness and efficiency of different national health systems and development strategies for reducing mortality and morbidity in the context of the various social contexts found in developing countries.

(36) Studies should be made to identify strategies to strengthen government action for more rapid reduction of levels and inequalities in mortality. Such studies should include the identification of better strategies to implement policies.

(37) Owing to the persistence and even increase of differences in mortality between the sexes and among different socio-economic groups in more developed countries, follow-up or follow-back surveys should be organized in selected countries to further document such morbidity and mortality differentials and to study the sources of such differentials.

(38) In order to respond more effectively to the effects on health and survivorship of many life-style characteristics, epidemiological, demographic and clinical research on the health effects of life-style characteristics should be intensified.

(39) Since new declines in mortality in countries that have already achieved low levels will result in accelerated aging of the population, the consequences of which include increased rates of morbidity, the United Nations, its specialized agencies, and other research institutes should undertake further studies on the problems associated with aging, and Governments should adopt appropriate measures to anticipate and successfully prepare for its consequences.

G. Technical co-operation

(40) Technical co-operation provided by international agencies to developing countries should be better co-ordinated so that the progress in each field of activity may be complementary and a balanced growth achieved. Different international agencies operating in the same country should share all information and their activities should be co-ordinated with those of the approriate national office.

(41) The United Nations system should stimulate activities and provide all necessary assistance to countries to encourage the health programmes that will be the most adequate and cost-effective for that country, and to assist in the training of personnel appropriate to the situation and with the necessary commitment to human service.

(42) Since there is a need for concerted national and international effort to improve strategies for ensuring health throughout the developing world, donor agencies are strongly urged to increase resources for the formulation, implementation and evaluation of health programmes.

(43) In addition to supporting health programmes, donor agencies should allocate increased resources for health information, health education and communication programmes; exchange of health information, technology and skills among developing countries; and mortality data collection, processing and analysis.

Notes and references

1/ *Report of the United Nations World Population Conference, 1974 Bucharest, 19-30 August 1974* (United Nations publication, Sales No. E.75.XIII.3), chap. I.

2/ See "List of papers", annex II.

3/ *Report of the World Assembly on Aging, Vienna, 26 July-6 August 1982* (United Nations publication, Sales No. E.82.I.16), chap. VI, sect. A.

4/ *Primary Health Care: Report of the International Conference on Primary Health Care, Alma Ata, Union of Soviet Socialist Republics, 6-12 September 1978. Jointly sponsosred by the World Health Organization and the United Nations Children's Fund* (Geneva, World Health Organization, 1978).

5/ See *Fertility and Family: Proceedings of the Expert Group on Fertility and Family, New Delhi, 5-11 January 1983* (ST/ESA/SER.A/88).

Annexes

ANNEX I

Agenda

1. Opening statements
2. Appointment of officers
3. Adoption of the agenda
4. Progress and prospects for mortality reduction
5. Interactions between health, mortality and development

6a. Health policies and their effects on mortality: developing countries

6b. Health policies and their effects on mortality: developed countries

7. Implementation of health policies
8. Overview of the discussion and policy implications
9. Adoption of the report and recommendations
10. Closure of the meeting

ANNEX II

List of papers

Symbol	Title and author
IESA/P/ICP.1984/EG.IV/1	Provisional agenda
IESA/P/ICP.1984/EG.IV/2	Annotated provisional agenda
IESA/P/ICP.1984/EG.IV/3	Mortality and health policy: highlights of the issues in the context of the World Population Plan of Action (Population Division, United Nations Secretariat)
IESA/P/ICP.1984/EG.IV/4	Will primary health care reduce infant and child mortality? A critique of some current strategies, with special reference to Africa and Asia (Henry Mosley)
IESA/P/ICP.1984/EG.IV/5	Evolution of diarrhoeal diseases and malnutrition in Costa Rica and role of interventions (Leonardo Mata)
IESA/P/ICP.1984/EG.IV/6	Impact of parasitic diseases and their control on mortality, with emphasis on malaria and Africa (L. Molineaux)
IESA/P/ICP.1984/EG.IV/7	Les implications des programmes nutritionnels pour la mortalité dans les pays en développement (Ivan Beghin and Marc Vanderveken)
IESA/P/ICP.1984/EG.IV/8	Social policy, health policy and mortality prospects in the developing world: immunization programmes (William H. Foege)
IESA/P/ICP.1984/EG.IV/9	Health intervention programmes and their implications for mortality in developed countries: cardio-vascular diseases (Lester Breslow)
IESA/P/ICP.1984/EG.IV/10	Les programmes d'intervention sanitaire et leurs conséquences sur la mortalité cancereuse dans les pays développés (F. Hatton, R. Flamant, M. H. Bouvier, L. Maujol)

IESA/P/ICP.1984/EG.IV/11	The influence of development-related changes on infant and childhood mortality in Africa (Economic Commission for Africa)
IESA/P/ICP.1984/EG.IV/12	Mortality and health policy (Centro Latinoamericano de Demografía)
IESA/P/ICP.1984/EG.IV/13	Technical co-operation in the field of mortality and health policy (Department of Technical Co-operation for Development, United Nations Secretariat)
IESA/P/ICP.1984/EG.IV/14	L'évolution de la mortalité dans les pays industrialisés (Jean Bourgeois-Pichat)
IESA/P/ICP.1984/EG.IV/15	Policies and programmes affecting mortality and health (World Health Organization)
IESA/P/ICP.1984/EG.IV/16	New hope in dark times: an assessment by the United Nations Children's Fund of a child survival package: its effectiveness and its social and economic feasibility (G. A. Cornia)
IESA/P/ICP.1984/EG.IV/17	El papel de la seguridad social en la mejora de la salud (International Social Security Association)
IESA/P/ICP.1984/EG.IV/18	Financial analysis: a critical determinant for the viability of health programmes (World Bank and William R. Harlan)
IESA/P/ICP.1984/EG.IV/19	Recent mortality levels and trends in national populations (Population Division, Department of International Economic and Social Affairs, United Nations Secretariat)
IESA/P/ICP.1984/EG.IV/20	Mortality decline and health policy: an overview of developing countries of the Asia-Pacific region (Economic and Social Commission for Asia and the Pacific)
IESA/P/ICP.1984/EG.IV/21	Findings of the World Fertility Survey on trends, differentials and determinants of mortality in developing countries (World Fertility Survey)

IESA/P/ICP.1984/EG.IV/22	Infant and child mortality in rural areas: implications for rural development programmes (Food and Agriculture Organization of the United Nations)
IESA/P/ICP.1984/EG.IV/23	Assistance by the United Nations Fund for Population Activities to mortality and health policies (United Nations Fund for Population Activities)

Annex III

OPENING STATEMENTS

A. Statement by the Executive Director of the United Nations Fund for Population Activities (UNFPA) and Secretary-General of the International Conference on Population

In 1974, infant mortality and life expectancy were the only areas in which the World Population Plan of Action specified precise targets. The Plan envisaged a minimum life expectancy at birth of 50 years by 1985 in countries with the highest level of mortality, and an increase in average life expectancy, to 62 years by 1985 and to 74 by the end of the century for the world as a whole.

Ten years later, it is clear that the targets adopted at Bucharest will not be met. At the same time, governments in the majority of developing countries perceive their mortality rates and life expectancy levels as unsatisfactory. It will be one of the functions of this meeting to recommend ways in which their concern may be translated into effective action and perhaps to suggest renewed targets for which countries may realistically aim.

Concern with mortality is of particular importance in relation to population policies. For an increasing number of countries, population growth is becoming a priority concern, as the growing proportion of national resources devoted to population programmes attests. Yet, planners in developing countries often miss the connection between attempts to reduce birth rates on the one hand and death rates on the other. In the countries and the times we know about, birth rates have fallen only after death rates have declined. It is particularly important to reduce infant mortality, because in this case the connection between birth and death is readily recognizable. For countries to achieve a balanced rate of population growth, a reduction in mortality may be as important as a reduction in birth rates. Yet, infant mortality rates in developing countries remain between five and six times as high as in the developed countries, while health expenditures as a proportion of gross national product are four or five times lower.

One of the targets of the World Population Plan of Action was a reduction in infant mortality rates, particularly in those countries experiencing the highest rates, to less than 120 per thousand by 1985. In some of these countries, deaths before the age of five account for as much as half of total mortality. A high proportion of these deaths are the result of infectious or parasitic diseases. Disease is made more dangerous by malnutrition, which increases susceptibility to disease and decreases the ability to throw it off, and is typically found among large families and the very poor. Though access to health care is the most important single element in bringing down mortality, in those countries which have registered the most rapid declines, their success has been traceable not only to a drastic reduction in parasitic and infectious diseases, but also to the guarantee of an adequate diet and the introduction of child spacing through modern family planning methods.

The attack on infectious and parasitic disease depends on preventive as well as curative health care, improvement of nutrition and introduction of family planning. It demands a programme which reaches out into every section of the society, but particularly into the rural areas where the majority of the developing world's people live.

Here the lessons learned in delivering family planning as part of population programmes, particularly in rural areas, can be effective. The urgency and the demand for family planning has stimulated innovation: in many countries the emphasis has shifted from the traditional clinic approach to alternative networks for motivation and service delivery. The importance of community support and the participation of community groups in providing services has been recognized in practice and is reflected in successful family planning programmes in many countries. Techniques successful in promoting family planning have become part of basic services to improve health and reduce mortality. No motivation is needed for mothers to desire the survival and good health of their children, but their practices are frequently at odds with their intention. When health care becomes a matter of community concern and involvement, effective techniques, although different from customary practice, become accepted as the norm.

This approach also has the advantage of bringing health care equally to all members of the community. At present, the poor are more susceptible to disease and have less access to health services. Rural populations are at greater risk than urban residents. One of the most important passages in the World Population Plan of Action recognizes these inequalities and it is a goal of the Plan to reduce them. It should be clearly stated once again by this meeting that in the quest for better health, lower mortality, slower population growth and overall development, a vital element is equal access to the benefits of development.

The cost of health networks, including population services, initially appears high, because it entails setting up training systems, with the physical and personnel inputs which this demands, and extensive supervision once training is complete. But investment in human resources has definite advantages, both because the resources are largely found within national borders and because it is a double investment -- first, in improving the quality of service supplied and, secondly, in broadening the range of skills available among the population as a whole.

In the present and likely future atmosphere of limited resources and hard choices, developing countries' governments and those who work with them have a responsibility to make the most effective use of the resources available. Better health and lower mortality have a high claim to consideration as development priorities, both for themselves and for their beneficial effects on many other aspects of development. Not least among these is population growth.

The approach outlined here concentrates on building social rather than physical capabilities. Investment in human resources is, over the long run, one of the most effective a country can make, but returns are found over the long-term rather than the short-term. We are finding in health, as we have found in family planning, that we should not seek short cuts; the steady building of an effective health service is part of the process of building the nation's capacity for development.

Extending life expectancy and reducing the toll of mortality has a bearing on the future structure of the population, which governments would do well to consider. Illness and premature death are a burden to society in economic as well as human terms. Despite short-term effects on population size, everything should be done to reduce this burden. At the same time, governments should consider what the long-term effects are going to be. There will be changes in age structure and in dependency rates as infant mortality decreases and the proportion of elderly increases. Demand for child care at one end of the scale and care of the elderly at the other will increase. Demand for employment will certainly increase, but so will the propensity to consume, though the pattern of consumption may well change. These long-term effects are so far in the future as to be over-shadowed by more pressing concerns, but nevertheless demand our consideration and our foresight.

This meeting is well aware that reducing premature mortality and improving the health of populations should be among the primary concerns of governments in developing countries. It is important to point out that this concern is not only humanitarian but has a direct bearing on the question of whether and how development is to be achieved.

B. Statement by the Director of the Population Division, Department of International Economic and Social Affairs of the United Nations Secretariat, and Deputy Secretary-General of the International Conference on Population, 1984

Mr. Mayor, Mr. Aiello and Mr. Minister,

Permit me to begin by saying that, to his great regret, Mr. Salas, Secretary-General of the International Conference on Population, is unable to be with us today because the duties of his post have kept him in New York. He asked me to present his apologies and to tell you that he will address you tomorrow morning.

On his behalf I want to express to the Italian Government, as represented by Mr. Balanzino, our whole-hearted appreciation for its generous hospitality to the Expert Group as it meets in this eternal city, where all the ages of humanity and all the art forms are so magnificently represented. There could not be a more appropriate setting for a theme as serious as the one which brings us together.

I would also like to express my thanks to the International Union for the Scientific Study of Population. Last February, in Paris, the Union's Committee on Factors Affecting Mortality and the Length of Life organized a seminar on social policy, health policy and mortality prospects, a topic very close to the theme of this meeting. In conjunction with the Union, we therefore decided that the Rome meeting might draw upon the findings of the Paris meeting in the formulation of recommendations designed to modify and improve upon the Bucharest Plan. The basic document prepared by the Secretariat is itself based largely on the work of the Paris meeting.

Three groups of experts have met since last January for the preparation of the Conference, the first on fertility and the family at New Delhi, the second on population distribution, migration and development at Hammamet, Tunisia, and the third on the interrelationships of population, resources, environment and development at Geneva.

The subject which brings us together in Rome is primarily characterized, unlike such issues as the family or population movements, by its generality, since death is universal. It overlooks no one. From the standpoint of the individual, it is a bit like a game of hide-and-seek: when we are there, it is not, and when it is there, we are not. It is the anguished journey in which no one can stand in for us, which each must face for himself.

But what concerns us here is not death as it affects the individual. We must deal primarily with the collective dimension of death as revealed by science, especially demography, which has long since taken the mystery out of death. Demographic computations, always impersonal, relieve death of its tragic nature. Death is an essential conditon for population renewal, and its full meaning becomes apparent in a demographic context. On a societal level death is a necessary evil, as can be seen in a fictitious projection of a population made up of immortals.

What we should study carefully is not only the statistical aspect, for death is also -- and increasingly so -- a social phenomenon, such as marriage or work or crime. It is not a drama with a single character. It may be represented not only according to the co-ordinates of time and space but also on the social level, in terms of education or income, for example. In this area of differential mortality, demographic facts become linked to value judgements, and to cultural and even psychological factors as they affect attitudes to disease and death. Moreover, the numerous economic, social and cultural aspects of death make it a policy-related area and thus representatives of Governments must be concerned with it, as they were at Bucharest and as they necessarily will be at Mexico City.

Death is a phenomenon which must be viewed not only in demographic and social terms but in terms of policy as well. Paradoxically, death is at once an irrevocable phenomenon and the result of political choices and thus susceptible of modification. The inability to alter life's ultimately finite nature must be countered with the changing prospects for postponing life's end, of preventing its thread from unravelling too quickly. That must be the objective of any health policy and the subject of our discussions at this meeting. However, the issue is not only one of trying to postpone a deadline; we must also consider the inherent potential in health policies, for improving the quality of life, alleviating suffering and trading one cause of death for a less painful one. Today people with incurable diseases can be kept alive for long periods of time, particularly in wealthy countries, although generally at considerable expense. The survival of such persons can significantly lengthen the average life span. Of interest to demographers as well as to politicians and economists is the calculation of postponed deaths and the cost involved; this is something akin to what we do in the area of fertility when we calculate, by means of finely tuned cost-benefit techniques, the number of births postponed or prevented by birth-control programmes.

Demographers, and those who finance their work, have often wrongly concluded that mortality research produces recommendations which are less operational than those resulting from fertility research, in the belief that mortality policies are the exclusive province of health specialists. However, I must reiterate that, where death is concerned, there is no research of the scope of the World Fertility Survey, and we shall see at this meeting how much this gap hinders the improvement of health, particularly in the third world. Would it not be better for research to deal as much with the protection of existing life, and especially the lives of those who are most vulnerable, as with potential life, that is, anticipated births?

In any event, the steady decline in fertility observed in developing countries may herald a shift of interest to other sectors of research, and we hope that health and mortality will be among those sectors.

One might add that, to date, Governments have attached no more importance to health than they have to such other sectors as education, employment or food. It is true that the fundamental problems of third-world countries are so numerous that their budgetary choices are difficult to make. But sacrificing one vital need for another is precisely the lesson of responsibility which policy-makers must learn. It is our duty at this meeting to draw the attention of decision-makers to the positive consequences which a reduction of morbidity and mortality can have for the development process, as indicated in the Secretariat document. There is no better illustration of the potential impact of that reduction than the fact that, in many third-world countries, the number of years of active life lost because of high mortality rates is roughly 15, while in the industrialized countries it is only two or three.

Over the next five days we shall discuss many problems; a good part of the time must be set aside for the drafting of the recommendations which will be adopted on the final day. Yet we should begin by asking, as briefly as possible, what the mortality levels and trends are, since the answer will serve as an essential background to our debates. It will, I am afraid, starkly reveal the inadequacy of our knowledge. We should endeavour to reply to a frequently-put question: To what extent is it true that the decline in mortality in the third world slowed down? Has the decline lost impetus to the point that, as some now maintain, mortality has increased in a number of countries, particularly in those south of the Sahara and in some Asian countries? What evidence do we have of this disquieting phenomenon? It is clear that, if it were to be confirmed, it would be alarming both because of what it reveals and what it portends. The question must be answered before we begin the discussions on policies aimed at restoring or improving specific situations.

This problem arises at a time when discussions in international forums are centering on the gulf which separates living conditions in third-world countries from those in the industrialized countries. There is no doubt that the differences between mortality levels are one of the most shocking indicators of development inequalities. The dilatory approach of the world community to closing this gap, as against its efforts to close the fertility gap, is regrettable. It is now certain that the targets set at the Bucharest Conference with regard to life expectancy at birth in third-world countries, not only for 1985 but for the end of the century, have almost no chance of being attained. Meanwhile, new achievements in mortality reduction are constantly being recorded in the rich countries, clearly demonstrating what can be accomplished under better conditions.

The Bucharest targets seem to us very remote. They should at the very least be revised so as to be more realistic: in that respect, we rely on your wisdom.

It should be realized that health problems in the third world present a completely different face from those in the rich countries. In the latter, mortality from infectious and parasitic diseases is very low, and degenerative diseases account for a large majority of deaths. In contrast, pathology in the third-world countries is poverty-related: infectious and parasitic diseases are still a very important cause of mortality. For many years now, it has been affirmed and reaffirmed that the decline in mortality in the third world observed during the 1950s and 1960s could be largely explained by exogenous factors, that is, by advances in public health and medical science and their dissemination, with economic and social factors playing a much smaller role. It now seems that the forces behind the decline in mortality were more complex. An analysis of individual diseases shows that in the case of some, such as malaria, tuberculosis and smallpox, a decisive role was played by improvements in the health system in the form of inexpensive methods, particularly vaccination, whereas in the case of others, including diarrhoea and certain infectious diseases, the crucial factor has been a change of economic conditions -- better food, housing, water supply and drainage system -- or cultural change.

A basic question which we shall have to deal with is the extent to which health systems are equipped to cope with the demands made of them.

The health strategy problem which arises today in the third world is, in fact, that of deciding what share of resources is to be allocated to the health system proper and what share to development efforts. We should even go further and consider what kind of health system and what form of development should be instituted to narrow the gap between rich and poor countries.

With respect to health systems, I think that we shall have no difficulty in agreeing that the technologies of the industrialized countries cannot be transferred unaltered to the third world inasmuch as they are not applicable to the entire population. As we have indicated in the Secretariat document, one of the primary objectives of a health policy in the third world is to provide the broadest possible health coverage rather than to concentrate the scarce resources only on the urban environment or on certain social classes. Simpler techniques than those in use in the developed countries and techniques that are capable of saving more human lives and are suited to the economic, social and cultural conditions of the third world must be found. The developing countries require technologies and know-how which are adapted to their epidemiological conditions. They must rely more on teams of doctors and auxiliary personnel who have not necessarily been trained according to the current technical canons of the rich countries, but who can diagnose the most obvious diseases, vaccinate, provide nutrition and family-planning guidance and take initiatives where water quality is concerned. The system must be "light", less centred on the urban hospital and geared to preventive care as much as to curative. This is what is called a "horizontal" or fully decentralized system, as opposed to a "vertical" system.

The most appropriate development strategy in the field of health does not necessarily have growth as its supreme goal nor the imitation of the consumption patterns of the rich countries. As we suggest in the Secretariat document, a health policy should be considered not only in terms of health services but also in terms of development policy. Health is not exclusively the business of the health system; indirectly, it is first and foremost the concern of development styles. Potable water and sewerage systems can save more human lives in the third world than medicine. Experience shows that very low infant mortality rates can be obtained in societies with a high level of education, even though health services are of moderate cost and economic levels are low. The cases of the state of Kerala in India and of Sri Lanka, China, Costa Rica and Cuba are well known.

If the notion of "premature" death means something, it is surely in the third world that it takes on full significance. This should not mask the fact that disparities of mortality between social classes within third world countries are perhaps more striking than in the rich countries.

What interests us primarily is the number of years of life that can be gained by better policies, not only in the health field but also in the economic and social fields, dealing with, for exammple, the environment, better nutrition and a higher level of education. People are even beginning to calculate the effect of different economic and social options on the reduction of mortality. As we have indicated in the Secretariat document, Sam Preston has shown by a simple mathematical correlation that an increase of 1 per cent of income per head is associated with an increase of 0.05 years of life expectancy, while if the increase in income were devoted to improving the education of mothers the gain in life expectancy would be from 4 to 8 years. Of course, to devote a possible increase in income entirely to a single factor such as the education of women is inconceivable, even though that factor can play a synergic role via-à-vis almost all the factors of development, but the calculation is sufficiently striking for policy-makers to be guided by it. An attempt should also be made to estimate the effects of individual public health measures, such as an improvement of water quality or an increase in food intake.

Few countries have implemented real primary health care policies, despite the recommendations made in 1978 by the Alma Ata Conference. It should be realized that there is a minimum of resources without which such policies cannot be implemented. Yet, as we have observed, in the poorest countries the amount of revenue devoted directly to health is between $5 and $10 per person per year, as compared to some $550 in the industrialized countries.

Although the health problems of the third world are extremely pressing, we must also recognize that the industrialized countries have their own problems.

Mortality has been considerably reduced among all social groups in those countries, but the full spectrum of social mortality differentials persists. This is at variance with the fact that since the Second World War social values have become the fundamental values of industrialized societies. Social security has become generalized, education has become accessible to broader segments of society, the unemployed have received better benefits. How then are we to explain why groups which were at the bottom of the social ladder 30 years ago, and which have since benefited from indisputable social progress, have not shared to the same extent as other groups in the over-all decline in mortality? Could it be that modern medical discoveries are too costly to be applied at all levels of society and that we are approaching an era when social and economic factors decide who is to receive the treatment based on the new technologies? If so, technological progress will place new and overwhelming responsibilities on the community. Or is it that the living conditions of the classes at the bottom of the social ladder make them more vulnerable to death than the other social categories? Or are both explanations valid? I doubt that differential mortality can be discussed without these questions being asked. Be that as it may, the exaggerated faith in medical treatment in the rich countries, where there is a tendency to turn to medicine for a cure as soon as a problem develops, ultimately diverts attention from the real problems and deters the search for genuine solutions, which lie in changes in social conditions and individual life-styles. The infatuation with the latest technology, which prompts the use of sophisticated, costly medical techniques, is at times so strong that it translates into desperate and senseless efforts to restore those whom death has already partly claimed, thereby inflicting an agonizing protracted martyrdom on them. It is my personal view that this is hardly a humanitarian way of easing the final transition.

In the rich countries, health is not simply a matter of economic power and technological know-how, but also one of will, as is demonstrated by the consumption of alcohol, tobacco and even of drugs, and by over-indulgence in food. Those countries are also witnessing the emergence of new health problems, with the dawning awareness of the fragility of our environment in relation to the powerful industrial technologies. This awareness sometimes takes the form of popular opposition, to nuclear energy, for example, even though nuclear energy has not yet harmed anyone.

Finally, there is a point which you will surely discuss and which should be covered in your recommendations: the improvement of information-gathering and of the analyses conducted in order to assist policy-makers. I think you will agree that more and better factual information about health and death is required and that analytical methods need yet to be refined.

I am convinced that this group of experts will be able to propose to the Conference secretariat recommendations designed to make action in the field of health and mortality more effective. On behalf of Mr. Salas, I thank you in advance.

Part Two

BACKGROUND PAPERS

I. OVERVIEW

A. Mortality and health policy: highlights of the issues in the context of the World Population Plan of Action

United Nations Secretariat*

INTRODUCTION

A long and healthy life is striven for by all people; the provision of such a life is a goal of all societies. As no society has attained an average life expectancy at birth near the maximum human life span, it is not surprising that two thirds of the Governments responding to the Fourth Population Inquiry among Governments were unsatisfied with the level of life expectancy their countries had reached. In most countries, if not all, the question remains how to incorporate health practices and health technology fully into the everyday life of all segments of society.

Issues related to progress towards achieving a long and healthy life and policies for the provision of the basic goods necessary to that end were discussed at the 1974 World Population Conference in Bucharest, and occupy a prominent place in the World Population Plan of Action 1/ which resulted from those discussions. The World Population Plan of Action mobilized Governments and the international community to attack the problems of low standards of living and earlier-than-necessary death. The mobilization took place on two fronts - action and research. On the action front, the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) organized in 1978 the Alma Ata Conference on Primary Health Care, 2/ which prepared the ground for national government efforts to establish community-based primary health care programmes in many developing countries. Health issues now have a conspicuous place in many national development plans, although actual resource commitment often remains small. On the research front, work programmes on determinants and consequences of mortality conditions are being undertaken by many national and international organizations, including the co-operative programme at the United Nations and WHO. Numerous international meetings to consider mortality and health issues have been organized by these two organizations, by the Committee for International Co-operation in National Research in Demography (CICRED), and by the International Union for the Scientific Study of Population (IUSSP), and other international, intergovernmental and non-governmental organizations. These activities have continued to be hampered by inadequate funds for the collection of data and the analysis of health and mortality issues.

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This background document, and the Expert Group on Mortality and Health Policy for which it has been prepared, will attempt to review the major issues and lessons learned since the 1974 World Population Conference. The document contains four major sections, organized to follow the provisional agenda of the Expert Group. The first section addresses current mortality conditions in the major regions of the world and considers progress made in achieving the goals of the World Population Plan of Action. The second section considers the interrelationships between mortality and health levels and differentials and development. It concentrates, therefore, on the synergistic relationship between health and development, including economic, social and health inequalities. These two sections in many ways form the context for the final two sections, which consider the effects of certain health policies and their implementation. Those sections examine the effects of selective programmes in such areas as immunization, nutrition, maternal and child health, environmental control and life-style interventions as well as financial and organizational obstacles to their implementation.

The present paper is intended as a review of major issues and as a guide to the discussion by the Expert Group. It does not, however, make recommendations concerning the World Population Plan of Action. Some sections of the paper are based on the discussions at and papers presented to the Seminar on Social Policy, Health Policy and Mortality Prospects convened at Paris in March 1983 by the IUSSP Committee on Factors Affecting Mortality and the Length of Life. Acknowledgement is due to IUSSP, to the organizing Committee of the Seminar and to the participants in the Seminar for allowing the United Nations Secretariat to draw upon the proceedings and documentation of the Seminar in the preparation of the present paper. The assistance of Mr. Henry Mosley is also acknowledged.

A number of other papers have also been made available to the participants to aid in the discussion. 3/ These include papers contributed by United Nations regional commissions and specialized agencies and by governmental and non-governmental organizations, as well as several papers originally presented to the IUSSP Seminar, for which the United Nations Secretariat is also grateful.

PROGRESS AND PROSPECTS FOR MORTALITY REDUCTION

Goals expressed in the World Population Plan of Action and other official documents

The reduction of mortality to low levels and the attainment of good health by all the world's peoples is regarded as a pressing goal by Governments and international organizations. The World Population Plan of Action states that "it is a goal of this Plan of Action to reduce mortality levels, particularly infant and maternal mortality levels, to the maximum extent possible in all regions of the world..." (para. 22), and that "many developing countries consider reduction of mortality, and particularly reduction of infant mortality, to be one of the most important and urgent goals" (para. 5). The attainment of this goal is viewed as both an individual and a collective good. As stated in the Declaration of the Alma Ata Conference on Primary Health Care, held in 1978, "...health, which is a state of complete physical, mental and social wellbeing, and not merely the absence of disease or infirmity, is a fundamental human right and...the attainment of the highest possible level of health is a most important world-wide social goal..." 4/ The right to the enjoyment of good health as a basic human right has also been affirmed by the two United Nations Symposia on Population and Human Rights. 5/

The World Population Plan of Action, adopted in 1974, gave quantitative targets for achieving certain minimum mortality goals by a fixed date. It recommended that "countries with the highest mortality levels should aim by 1985 to have an expectation of life at birth of at least 50 years and an infant mortality rate of less than 120 per thousand live births" (para. 23). The Plan of Action also implied that specified average values of life expectancy should be attained by the world and its major less developed regions, stating that "the attainment of an average expectation of life of 62 years by 1985 and 74 years by the year 2000 for the world as a whole would require by the end of the century an increase of 11 years for Latin America, 17 years for Asia and 28 years for Africa" (para. 22).

A review of mortality levels in 1980-1985, based on United Nations estimates and projections, reveals the progress made towards achieving these goals. Because the values for less developed countries are often based on incomplete or faulty data, they should be viewed with caution.

The world mortality situation in 1980-1985 is characterized by continued wide gaps between the more developed and the less developed regions, as well as among subregions. 6/ Life expectancy at birth in 1980-1985 7/ for both sexes is estimated at 73 years in the developed regions and 57 years in the developing regions, a gap of 16 years. Life expectancy at birth is lowest in Africa - 50 years - followed by 54 years in South Asia and 58 years in the developing regions of Oceania. Latin America is next, with an overall figure of 64 years. The 1980-1985 life expectancy for East Asia, 68 years, reflects the value of 77 years for Japan and 67 years for China and other East Asian countries. In the more developed regions life expectancy is estimated at 71 years in the Union of Soviet Socialist Republics, 73 years in Europe, 74 years in Northern America, and Australia-New Zealand, and, as mentioned, 77 years in Japan.

There is some cause for satisfaction in these figures, particularly that relating to the high level of life expectancy attained by China, which contains 22 per cent of the world's population and nearly 30 per cent of the population of the less developed regions. Owing in large measure to recent rapid mortality improvement in China, world life expectancy in 1985 is expected to be only about two years below the value of 62 years mentioned in the World Population Plan of Action. However, life expectancy is still unacceptably low in many countries. When the World Population Plan of Action was adopted in 1974, 56 countries were estimated to have a life expectancy at birth below 50 years. Of these, only half are likely to attain the goal of a life expectancy of at least 50 years by 1985 or soon afterwards. The countries that are not likely to achieve this target are all in sub-Saharan Africa or South Asia. A total of 67 countries (47 in Africa, 16 in Asia, 3 in Latin America and 1 in Oceania) with a combined population of 1.9 billion are not likely to achieve a life expectancy of 62 years by 1985 or soon after. An average life expectancy of 74 years in the year 2000 will have been attained in the more developed regions. In the less developed regions, however, China is expected to fall short of the mark by only 2 or 3 years, Latin America by 5 years, South Asia by 13 years and Africa by 17 years. 8/

Mortality disparities among regions are very large during the first year of life, a vulnerable period during which unsanitary conditions and poor nutritional status are reflected in very high infant death rates in large parts of the less developed world. At present (1980-1985) infant mortality is estimated to be more than five times as high in the developing as in the developed regions (91 and 17, respectively, per 1,000 live births). The infant mortality rates are highest in Africa (114) and South Asia (109). The estimated rates in the remaining regions are: the developing regions of Oceania, 78; Latin America, 63; East Asia, 36; the Union of Soviet Socialist Republics, 25; Europe, 16; Northen America, 12; and Australia-New Zealand, 11. 9/ The rate is below 10 in Japan and a number of other developed countries. It is estimated that 27 countries - all in Africa or South Asia - are not likely to achieve infant mortality rates below 120 per 1,000 births by 1985, as recommended in the World Population Plan of Action (para. 23).

Mortality goals have been formulated more recently in connection with the Global Strategy for Health for All by the Year 2000 10/ and the International Development Strategy for the Third United Nations Development Decade. 11/ In accordance with the Global Strategy, which was adopted by the World Health Assembly in 1981 and endorsed by the United Nations General Assembly in the same year, 12/ countries should strive to attain the "highest possible" level of health "in keeping with their social and economic capacities." 13/ However, "...a minimum life expectancy of 60 years or more at birth and a maximum infant mortality rate of 50 per 1,000 live births are suggested as indicating that the health status of the population is becoming a decreasing burden on individual, family and community development." 14/

The mortality targets of the International Development Strategy are expressed as follows:

> "The reduction of mortality rates will be a major objective. In the poorest countries, infant mortality should be reduced to less than 120 per 1,000 live births [by 1990]. Life expectancy in all countries should reach 60 years as a minimum, and infant mortality rates should reach 50 per 1,000 live births as a maximum, by the year 2000." 15/

The mortality goals and prospects described in the preceding paragraphs do not, of course, take into account the possibility of catastrophic mortality from large-scale wars, which have the potential to cause enormous loss of lives. The stockpiles of nuclear weapons already on hand were estimated in 1980 to be equivalent to 1 million Hiroshima bombs - sufficient to destroy every man, woman and child on earth many times over, and to poison the planet for future generations. A United Nations expert report which estimates some of the likely morbidity and mortality effects of employing nuclear weapons of different types and sizes makes chilling reading. According to the report, "with long-range nuclear weapons it has become possible to wreak near-complete eradication of a nation's population and devastation of its economy in less than a day's time and on less than an hour's notice." 16/ Limited wars in which conventional weapons are employed would also have serious direct health consequences for the countries involved in terms of persons killed or wounded, and indirect consequences in terms of the diversion of scarce resources needed for health and development programmes to military purposes. There is also an ever-present danger of escalation of such wars into global and nuclear conflicts.

Recent mortality trends 17/

The question whether mortality decline has been slowing in the less developed regions has recently been addressed in several reports. 18/ It is not possible to discuss this issue without emphasizing the serious data problems that exist. For many developing countries, data which can be used for estimating mortality trends are scanty, defective or out of date, so that recent trends are in doubt. This is particularly true for sub-Saharan Africa, where, on the one hand, death registration is very incomplete for most countries and, on the other, few countries have a series of censuses or sample surveys for three points in time from which changing trends may be established. Based on fragmentary data for years in the 1970s, infant and overall mortality were still high in that region, 19/ implying only a slow pace of decline. Non-demographic evidence which suggests stagnating, or even deteriorating, environmental, economic, social and political conditions in many of these countries 20/ supports the plausibility of these trends.

Data for many Asian countries are also inadequate for measuring changing mortality trends. However, there is evidence of a general decline in mortality levels in most countries of that region. 21/ The evidence for a rapid mortality decline in China after around 1950 is convincing 22/ and, as mentioned earlier, current life expectancy is estimated to be close to that of the more developed regions. In contrast, mortality decline on the Indian sub-continent, where life expectancy is estimated to be still relatively low (in the range of about 47 to 53 years), is proceeding at a slow pace. Recent estimates of mortality trends in India based on intercensal analysis and sample registration scheme data showed a gain of about 2.5 years in life expectancy at birth from 1966 to 1971, but a virtual cessation of improvement between 1971 and 1977. 23/

Several analyses of mortality trends in Latin American countries have found, for most countries for which the requisite data were available, a deceleration in the pace of mortality decline in the 1960s compared with the generally rapid pace in the 1950s. The decelerations have occurred at levels of life expectancy below the maximum levels observed in more developed countries. 24/ The determination of trends for the 1970s for most countries, based on levels of life expectancy, must await the availability of data from the 1980 round of censuses. However, infant mortality rates for the 1970s are available for 12 Latin American countries with relatively complete death registration, and in 8 of them, average annual rates of infant mortality decline were greater in the 1970s than in the 1960s. It was possible to calculate a measure of adult mortality (based on age-specific death rates) for the 1970s for only four of these countries, and in three cases the average annual mortality decline was more rapid in the 1970s than in the 1960s. 25/ These countries with relatively complete death registration cannot be considered typical, however, as they generally have lower than average mortality for their region.

Recent trends in life expectancy in developed countries have varied markedly among regions. Mortality decline was much more rapid in the 1970s than in the 1960s in Northern America, Western Europe and Australia-New Zealand, which experienced increases of from two to three years in life expectancy for each sex between 1970 and the late 1970s. (In a number of countries in these regions and in Northern Europe male life expectancy had stagnated, or even declined slightly, in the 1960s.) Recent mortality trends in countries of Eastern Europe, on the other hand, have been unfavourable, particularly among males. In most of these countries male life expectancy stagnated or declined between 1975 and 1980, and female life expectancy was virtually unchanged. As in some of the less developed countries, the recent slowdowns have occurred at less than optimum mortality levels. The factors underlying the changing pace of mortality decline in the different subregions are not clear, despite the detailed mortality data available for these countries.

Principal causes of death

While the cause-of-death patterns are known in a general way for the less developed regions, precise quantitative data by causes of death are often scarce, particularly for the countries with the highest mortality levels. In general, the higher the level of mortality in a population, the greater the proportion of deaths from disease caused by organisms - the infectious, parasitic, acute respiratory and diarrhoeal diseases - and the lower the fraction caused by the chronic degenerative diseases. As mortality declines, the first-mentioned groups diminish in importance, and a "modern" pattern emerges in which cardio-vascular diseases and neoplasms account for most deaths. The latter pattern characterizes the more developed countries and a number of less developed countries which have achieved relatively low mortality. 26/ These patterns are illustrated in the table 1, which is based on data for the more developed countries and for a group of five less developed countries with life expectancy at birth (e_0) ranging from around 55 to 65 years.

These data show large differences between the two groups of countries in relative importance of the major categories of causes of death. Had comparable data been available for countries with a life expectancy of less than 55 years, the differences would have been even sharper. Because of the relatively young age structures of many less developed countries, and the relatively high mortality among children under five years, the overall distributions of deaths by cause are heavily weighted by the diseases

Table 1. Percentage distributions of deaths by cause in the late 1970s

Causes of death	Five developing countries with e_o around 55 to 65 years	Developed countries (representing 85 per cent of all deaths in developed countries) e_o more than 70 years
Infectious and parasitic diseases	17	1
Respiratory diseases (acute or chronic)	18	8
Accidents and violence	7	7
Cardiovascular diseases	18	48
Neoplasms	8	21
All other causes	32	15
	100	100

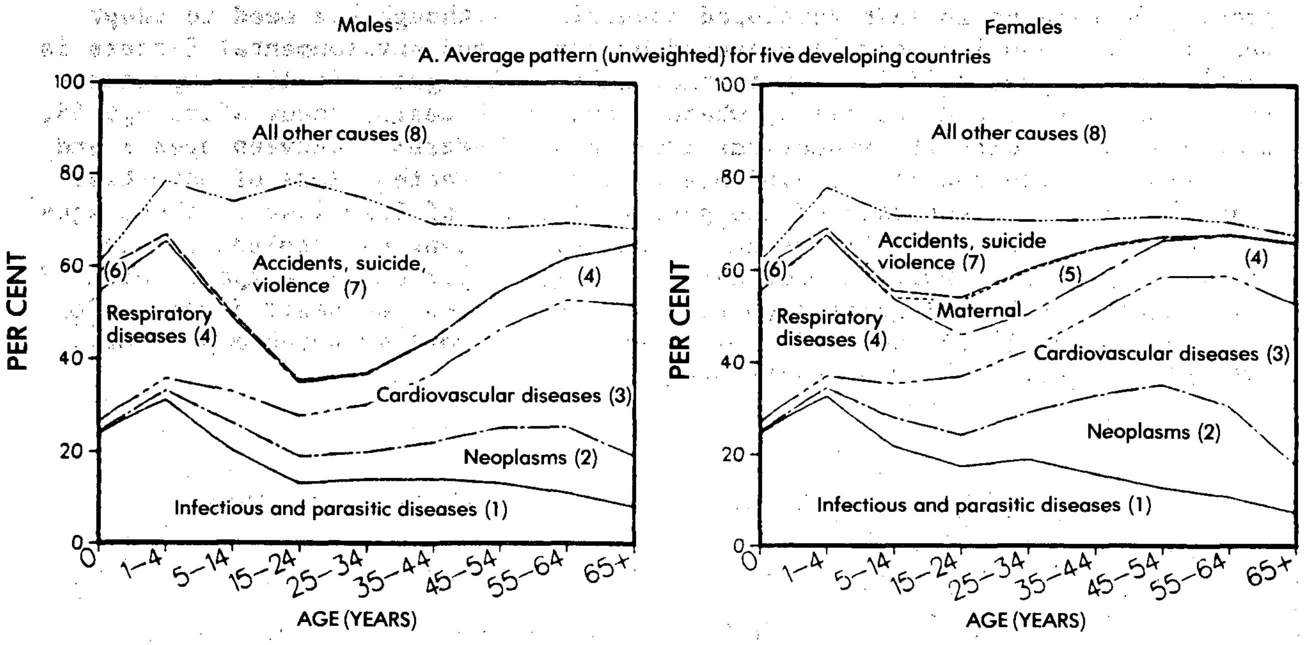
Source: Based on data from World Health Organization data bank.

prevalent among the young (infectious, parasitic, diarrhoeal), while in the more developed countries the distributions are weighted by the diseases that afflict older adults. Even within age groups, however, the less developed countries have relatively more deaths from the infectious diseases and relatively fewer from the degenerative diseases (Fig. 1A and B).

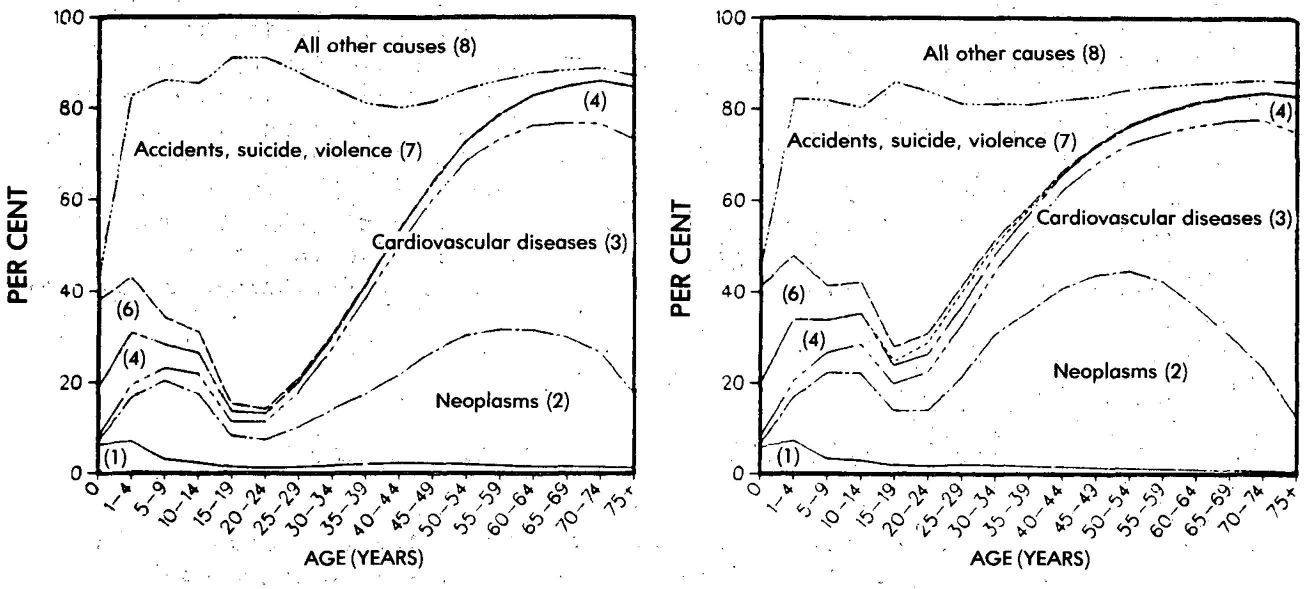
The World Population Plan of Action has recommended "particularly vigorous efforts" to reduce mortality and morbidity in population groups with special health problems, viz. infants, young children and women in reproductive ages (para. 24(a)). During the reproductive years, women in high-mortality countries experience mortality related directly or indirectly to frequent pregnancies and childbirth, resulting in some countries in a reversal of the usual pattern of excess male mortality at these ages. In populations with the highest mortality, deaths of children under five years of age can amount to 50 per cent or more of all deaths. 27/ In addition to deaths caused by infectious organisms, nutritional deficiency is very important as both an underlying and a contributing cause of childhood mortality in these countries, although it is only infrequently recorded as such. Much of this childhood mortality could be prevented through simple and effective technologies that already exist.

Figure I. Cause-of-death patterns in developed countries and selected developing countries by sex and age-group, late 1970s (Percentage distributions of deaths by cause)

A. Average pattern (unweighted) for five developing countries



B. Average pattern for developed countries



Source: Data from World Health Organization data bank.

NOTE: Figure 1A is based on unweighted averages of the percentage distributions of causes of death for Chile, Iran (urban population), Mexico, Peru and Philippines, and should not be considered representative of the developing regions. Figure 1B is based on data for 33 countries representing 85 per cent of all deaths in the developed regions.

Category (1) refers to infectious and parasitic diseases; (4) to acute and chronic respiratory diseases; and (6) to congenital anomalies.

The Plan of Action does not specifically mention the degenerative diseases, despite their prominence in more developed countries and their growing importance in less developed countries (although the need to adopt measures for reducing mortality caused by social and environmental factors is mentioned in para. 24(f)). Any further substantial gains in life expectancy in the more developed countries, where 7 out of 10 deaths occur after age 65, must come from mortality reductions from these diseases. Between ages 1 and 65 years in these countries, violence causes the greatest loss of potential years of life. An estimate of the potential years of life lost at these ages in the United States in 1980 revealed that 41 per cent had violent causes (accidents, 27 per cent; suicide and homicide, 14 per cent), compared with 18 per cent caused by malignant neoplasms and 16 per cent by heart disease. 28/ This type of analysis identifies priority health problems which may be most amenable to control by preventive measures.

II. INTERACTIONS BETWEEN HEALTH, MORTALITY AND DEVELOPMENT

Introduction

No country has reached an advanced level of economic and social development without a prior or concomitant reduction of mortality to a low level. This is as expected, since a long and healthy life is a defining characteristic of development; it is also a facilitator of other development characteristics. As stated in the Declaration of the Alma Ata Conference on Primary Health Care, "the promotion and protection of the health of the people is essential to sustained economic and social development". 29/ In view of the fact that mortality decline and health improvement are fundamental characteristics of the development process, the following sections review some interrelationships.

Effects of development on mortality and health

The World Population Plan of Action notes that "the reduction of morbidity and mortality to the maximum feasible extent is a major goal of every human society" and recommends that "it should be achieved in conjunction with massive social and economic development" (para. 20). While "development" is undefined, the Plan includes indications of the scope of development goals, viz; "the promotion of social justice, social mobility and social development, particularly by means of a wide participation of the population in development and a more equitable distribution of income, land, social services and amenities" (para. 32(c)). This specification is significant because strategies for accelerated economic development must be considered in the context of social development, and different development scenarios may each have its own major health implications, especially in the less developed countries. 30/

While it is well recognized that the causes of mortality decline are multifactorial, until recent years little attention had been given to critically defining the specific key determinants in the development process because downward trends seemed to be the rule, almost independently of the national development strategies that countries were pursuing. Over the past decade, however, the growing evidence of a stagnation of mortality decline at low levels of life expectancy in a number of less developed countries, coupled with trends suggesting deterioration in the health gains in some more developed countries, has been leading to more critical assessment by national and international groups of how social and economic policies and programmes affect health. 31/

To turn first to the developing countries, the high level of mortality seen in these countries is but one dimension of the problem of poverty; other dimensions are low levels of literacy and low productivity because of poor health, lack of skills, and inability to acquire physical capital. At the international level, the connection between poverty and mortality is broadly illustrated by the strong correlation between the gross national product (GNP) per person and life expectancy. 32/ A closer examination of the correlation of life expectancy with GNP per person reveals a very wide dispersion when individual countries are considered. 33/ For example, China, Cuba and Sri Lanka (and the state of Kerala in India) show unusually high life expectancies at low-income levels, while the oil-producing countries of Iraq, Iran, Libya, and Saudi Arabia have far lower life expectancies at levels of national income 10 to 20 times higher. This indicates that it is not only the aggregate income level achieved by economic growth but also the structure of economic growth, particularly as it relates to the distribution of social benefits, that can markedly influence mortality levels.

For example, the national government institutions of many less developed countries have highly centralized administrative structures with weak extensions into the rural areas. Often associated with this governmental structure is an ecological structure of highly developed but small élite urban sectors located in a single primate city or in a few large cities surrounded by relatively underdeveloped rural areas. This results in an urban bias in many government institutions in less developed countries and is evident in formal health systems which reach 20 per cent or less of the rural populations in most African countries and in many countries of Asia and Latin America. 34/

An additional distinguishing feature of many less developed countries is a dependency on foreign economies, usually characterized by high rates of foreign investment and an ever-growing foreign debt. This tends to impose its own shape and direction on the structure of the productive system, with its own consequences for social welfare. 35/ The critical nature of this dependency relationship vis-à-vis the development goals of the less developed countries has become dramatically manifest in the past few years as the stagnation of the economies of the more developed countries has led to a global recession and brought some less developed countries to the verge of economic collapse because of the loss of foreign markets and massive foreign debts. This is not only forcing a drastic curtailment of many new development projects, but is also leading to a widespread decline in the levels of living in many countries where large proportions of the population were already surviving at a marginal level of existence.

Evidence from several areas of the world has clearly shown that economic deterioration in a society can be directly translated into rising death rates. At one extreme are the famines in 1973-1974 in Ethiopia, and in 1974 in Bangladesh, where droughts caused local declines in farm incomes leading to starvation in the affected areas because people could not afford to buy food from unaffected areas. 36/ In the same period, Sri Lanka faced a national food crisis owing to a partial crop failure, a rise in the price of food imports and an oil-price rise, forcing the Government to halve the free rice rations and increase the price of food. Because these changes were coupled with depressed prices for exports of tea and rubber, the impact fell most heavily on the estate workers, whose wages were already depressed, and this resulted directly in an almost 100 per cent increase in mortality. 37/

Sustained high, or even rising, mortality rates in less developed countries are a function not only of uncontrollable natural disasters or external economic forces, but also of the balance Governments choose between, on the one hand, development strategies favouring capital accumulation and concentrated investments, primarily designed to maximize economic growth, and, on the other, strategies oriented more strongly towards meeting basic needs and reducing inequalities in income and wealth. For example, it seems that policies adopted in Brazil to control inflation and stimulate economic growth by a strategy of allowing pay increases to lag behind rises in the cost of living resulted unexpectedly in a general rise in the level of infant mortality in the city of Sao Paulo in the late 1960s and early 1970s. The resulting reduction of purchasing power reduced the ability of families, especially those in the lowest income groups, to purchase adequate food, housing, sanitation and health. After 1974 the infant mortality rate did fall again to the pre-crisis level, presumably owing to government extension of basic sanitation and increased coverage by the social security system. Government social welfare programmes provided the necessary services when they could not be afforded in the private sector. 38/

While low family income can influence mortality rates directly by reducing diet quality and quantity, reducing access to medical facilities and limiting investments in better housing and sanitation facilities, it also can have indirect effects: when poor women are forced to work outside the home, their children may suffer from neglect in care and feeding. 39/ Often this feeding problem is compounded by commercial interests which promote bottle-feeding of infants as a "modern" substitute for breast-feeding.

Since education, particularly women's education, is strongly associated with low levels of infant and child mortality, less developed countries which have placed a high priority on education for both sexes generally have higher life expectancies relative to their levels of income. This has been well documented for many countries, particularly in Latin America and Asia but also in sub-Saharan Africa. 40/

From the standpoint of national development strategy, if the option in terms of mortality impact is raising per capita income versus raising education levels, it has been observed from cross-national correlation analysis that while a 1 per cent rise in income is associated with a 0.05 year gain in life expectancy, if the 1 per cent gain in income were directed toward primary schooling the estimated gain in life expectancy would be four to eight years. 41/ (There would be a time lag, however, as the mortality relationship has to do with adult education.)

The observation regarding mass education and mortality is consistent with the fact that generally less developed countries which have pursued development strategies stressing the distribution of social benefits have reached some of the highest levels of life expectancy relative to income. Classic examples are China, Sri Lanka, Cuba and the state of Kerala in India. 42/ A more recent example is Costa Rica, which has achieved dramatic gains in life expectancy in the past decade as a direct consequence of a health and social development strategy directed specifically to the most disadvantaged groups in the population. 43/

Beyond these macro developmental factors of income growth, and the distribution of social benefits, there are many other elements of the development process' impact on health which should be noted. For example, agricultural transformation may precipitate childhood malnutrition if appropriate food for purchase is not readily available, as families move from subsistence food crops to cash crops. Also ecological changes, e.g., irrigation systems, can lead to higher rates of water-borne and water-associated diseases such as malaria and schistosomiasis. As the society becomes more consumer oriented, commercial enterprises may promote unnecessary and even dangerous products such as baby bottles and unsafe drugs, among the rising population of consumers. Generally, a rising industrial sector will be associated with many more health hazards than are now seen in the more developed countries because of poorer health and training of the workers, lower safety standards and fewer or no environmental pollution controls. Similarly, the traffic accident rates are far higher because of poorer vehicle and road maintenance, less skilled drivers and more congested roads.

To turn to the more developed countries, the general process of development has been accompanied by a range of mortality responses. Generally, for infants and children under age 15 there has been a progressive decline in mortality with the steady control of infectious diseases owing to the high level of environmental sanitation, and good nutrition. (It is noteworthy that even in the more developed countries the infant mortality rate continues to correlate closely with per capita GNP). 44/ Among adults, however, development has had mixed effects; while there has been a decline in rates of death caused by infections, particularly tuberculosis, and by some forms of cancer (e.g., stomach), there has been a rise in mortality caused by "diseases of affluence" - i.e., coronary heart disease, cancer, motor vehicle accidents, alcoholism, suicides and homicides, particularly among males. 45/

When we look at the broad connection between development and one disease of affluence, namely, cardio-vascular disease, it is clear that the incidence of that disease and particularly coronary heart disease (in all countries except Japan) rose to become the single leading cause of death in the more developed countries by the middle of the twentieth century. Major determinants are life style factors such as high blood pressure related to obesity and high salt intake, high consumption of animal fats, cigarette smoking and physical inactivity. 46/ In the past two decades, however, there has been a decline in cardio-vascular mortality in the United States, Australia and many countries of Western Europe, with several studies correlating this with declines in consumption of animal fat and in cigarette smoking. 47/ Over this same period a continuing rise in cardio-vascular mortality in the Union of Soviet Socialist Republics has been associated with a large rise in the consumption of meat, eggs, and milk products and in smoking. 48/ Deaths from cancer, especially lung cancer, are also closely tied to development-related changes in life-style such as diet and tobacco as well as being tied, but perhaps less closely, to the modern environment, namely, hazards of the work-place and industrial pollution of the air and water. The role of life style and of the potential political will of Governments to control industrial pollution suggests that even the new epidemic diseases of affluence may be ultimately controllable, though the social policy mechanisms are obscure. That these diseases of affluence pose a threat to the less developed countries is also evidenced by the more than 100 per cent rise in cardio-vascular deaths among middle-aged men in Sri Lanka between 1953 and 1971. 49/

Japan must be singled out as a unique case among more developed countries both because of the spectacular improvement in life expectancy since the end of the Second World War and because of the high levels reached, especially among males. The reduction in tuberculosis contributed the most to the decrease in mortality from 1950 to 1980, but mortality from cardio-vascular diseases, already at very low levels for a more developed country, has also declined sharply. 50/ Because this mortality improvement has occurred concurrently with a rapidly developing economy and the institution of a wide range of health and social benefits to the population as well as several special disease-control programmes, it is not possible to single out the social strategies that might have been most critical for the advances produced.

The contrasting levels and trends in mortality between the more developed countries of Eastern Europe, Western Europe and Japan seem to lead to two broad generalizations: first, that a high level of economic development does not necessarily lead to steady gains in life expectancy; and, secondly, that in spite of the large amounts of data available from the more developed countries there is an insufficient base of knowledge to explain adequately why such specific variations in the mortality levels and trends are occurring in the respective countries.

Consequences of mortality and health improvement for development

The clearest effects of mortality decline on development are on demographic characteristics, mainly the growth rate of the population and its age distribution. These effects are not discussed in the World Population Plan of Action. Mortality decline was the primary factor responsible for the dramatic rise in population during the nineteenth century among the now-developed countries and for the unprecedentedly fast pace of post-war population growth in the currently developing world. The positive or negative consequences of these rapid rates of population growth for development have been the subject of considerable debate. However, it is worth noting that a rapid rise in life expectancy among developing countries to levels now typical of more developed countries would not in most areas have as large an effect on population growth rates as the rise experienced by less developed countries during the 20 years following the Second World War because the death-rate component has generally already reached moderate or low levels. 51/

Fertility and migration remaining constant, the effect of mortality decline on the age distribution of the population depends solely on the age pattern of mortality change. Under typical patterns of mortality change, comparisons of stable populations suggest that mortality decline will lead to a decrease in the proportion of the population at the childbearing and economically active ages. The exact nature of the change depends on the initial mortality level. As mortality moves from high to moderate levels, declines take place in the proportion aged 15 to 65 with a corresponding increase in the dependent population, mainly among the under-15 age group. By contrast, movement from moderate mortality to low mortality leads to a continued decline in the proportion aged 15 to 65, with most of the corresponding increase taking place in the population aged 65 and over. Increases in proportions of the population in these dependent age groups raise issues of family and societal support for education, entry and exit from the labour force, social and economic mobility, and retirement. Age-distribution concerns in the developing countries have concentrated on the high proportions of the populations in the infant and childhood age groups, whereas concern in the more developed countries has centred on the high proportion at the older ages. The foregoing analysis points up the fact that in average conditions in less developed countries (i.e., a life expectancy at birth of around 50 to 60 years) continued declines in mortality would not be expected to lead to as important increases in the 0 to 15 population as did earlier improvements in mortality rates. Reduction of the proportion of the population aged 0 to 15 depends on the reduction of fertility. That is true under typical patterns of mortality decline. However, if the mortality decline results from health intervention programmes targetted at a selected age group, such as infants and children, age-distribution effects may differ. In the past, mortality declines in the more developed countries have made only a small contribution to increases in the proportion of the population aged 65 and over; the aging of the populations was mainly the result of past fertility trends. 52/ But now a high proportion of mortality is centred on the oldest ages; declines in these age groups will greatly accelerate population aging.

Mortality declines can also have effects on other components of population change; for example, on fertility. Under moderate to high mortality conditions, mortality decline would lead to longer survival of married couples and hence to higher proportions of women subject to the risks of pregnancy. This can lead to higher total fertility rates, if age-specific marital fertility rates remain unchanged. This effect could raise the total fertility rate by around 5 per cent (depending on the initial level of mortality). 53/ An even greater effect could be expected if a corresponding improvement in health led to improved fecundity, including decrease in foetal mortality and hence higher marital fertility. The age-distributional effect mentioned in the previous paragraph will, on the contrary, lead to proportionally fewer women in the childbearing ages and hence have a negative effect on the crude birth rate.

Under situations of controlled fertility, even the impact of longer joint survival can be weakened when marital fertility rates do not remain constant. Although reduced infant mortality, especially in the presence of traditional lactation practices, can lead to longer birth intervals and therefore reduced fertility, the number of surviving children per woman will rise. 54/ If a certain number of surviving children is desired, parents will need to adjust their reproduction goals in order not to exceed that number in the face of declining mortality. The World Population Plan of Action appears to note this potential relationship, stating:

> "... Sustained reductions in fertility have generally been preceded by reductions in mortality. Although this relationship is complex, mortality reduction may be a prerequisite to a decline in fertility." (para. 21).

However, demographic effects of mortality decline may not be limited to fertility only. As families and individuals adjust to new conditions caused by the control of mortality, new patterns of nuptiality and migration may also emerge. 55/

Discussions of economic consequences of mortality decline have generally concentrated on the effects of population growth on production and consumption and on the effect of longer and healthier survivorship on the quality of the work force and productivity. The effect of a high rate of population growth (owing to a sustained mortality decline) on economic development appears to be inconclusive, depending upon responses of other factors such as savings and capital investment, human capital and productivity, land use and economies of scale.

Increased survivorship and improved health have their own potential positive effect on economic growth through such factors as lengthening of expected years of working life, increase in physical and mental ability among workers, fewer days lost from work, and greater incentive for investment in schooling, and on-the-job training and for other human investment. All of these factors could lead to higher ratios of output per unit of human and physical capital. The empirical studies of the role of health in thus improving productivity are neither large in number nor conclusive, but they generally point to the positive effects of greater longevity and improved health. 56/ Health should not be regarded as a single variable. For example, lower incidence of morbidity from some parasitic diseases is correlated with higher productivity, but from other parasitic infections it is not. 57/ Part of the effect of health on work productivity may also be indirect, acting through the education variable. Improved nutrition has positive effects on school performance, and school performance in turn affects later work productivity. 58/ The potential significance of these issues is noted in the World Population Plan of Action, which recommends "particularly vigorous efforts to achieve ... improvement of poor health and nutritional conditions which adversely affect working-age populations and their productivity and thus undermine development efforts" (para. 24).

Mortality declines also have important familial and societal implications. These implications are not considered in the World Population Plan of Action. A basic change is the number of years and proportion of life spent carrying out various primary social functions. One study has shown that as life expectancy increases from 35 years to over 70 years at birth, the number of years expected to be spent with neither parenting nor work responsibilities increases from one year to 12 for males, and from 5 years to 23 for females. 59/ Widowhood and orphanhood incidence and prevalence can also be affected, as well as ages at which these events take place. For example, assuming other aspects of nuptiality remain unchanged, the proportion widowed in the total population would decline. However, for the average person, the expected number of years of widowhood would remain largely unchanged, although the onset of widowhood would be delayed to a much older age. 60/ The age of widowhood would now be more likely to occur during a period of life beyond the labour-force ages, where provision of one's own support is less likely. The additional economic, social and psychological support needed because of such changes may have to be absorbed by national social service programmes such as pensions and health insurance schemes and other support programmes. Nevertheless, the mortality decline itself would be expected to increase the frequency of kin who could also provide support. The effect of mortality decline on orphanhood may have some demographic similarities to widowhood but its implications are very different. Parallel to the widowhood effect, the mortality decline raises the expected age of parental loss. However, with respect to orphanhood the effect will be to reduce the proportion orphaned during the childhood years. Loss of parents will more likely occur during the adult years, when the individual is mature and self-supporting and in less need of economic and social support programmes. Lower levels of mortality may also lead to important attitudinal changes. For example, mortality declines among children may affect perceptions of the value of children and intergenerational flows of resources; declines among adults may affect attitudes towards remarriage as well as kinds of living arrangements.

Differentials in mortality and morbidity

Although a decline in mortality and morbidity is brought about by the rise in the standard of living and the advancement of medical technology, people benefit selectively from such progress. There are, in fact, significant differentials in mortality and morbidity in most countries. The intranational differences are produced by the unequal distribution of resources, skills and knowledge for the promotion of health and the prevention and treatment of diseases among social groups and geographical regions, often resulting from the national strategies for development and policy decisions on welfare and health. The differentials also reflect variations in environmental conditions of places of residence and work.

The inequality with respect to mortality is recognized in the World Population Plan of Action and its reduction as well as the reduction of the overall mortality level is stressed: "It is a goal of this Plan of Action to reduce mortality levels ... and to reduce national and subnational differentials therein" (para. 22). The mortality condition of a country in which underpriviledged segments suffer from considerably higher mortality may not be deemed satisfactory even if the country has attained some success in reduction of the overall mortality level by reaching and passing the numerical targets suggested in the World Population Plan of Action. It is thus recommended in the World Population Plan of Action that "reduction or, if possible, elimination of differential morbidity and mortality within countries, particularly with regard to differentials between regions, urban and rural areas, social and ethnic groups, and the sexes" (para. 24(c)) be achieved.

The inequality in morbidity and mortality is, however, still substantial in both developing and developed nations. For some developed countries, such as France, the United Kingdom and the United States, data are available for analysing trends over time in mortality differentials. The data seem to provide little evidence to support the earlier, rather naive, expectation that the decline in the overall mortality level would automatically be followed by a reduction in mortality differentials. In fact, the magnitude of variations is often striking. A study of mortality differentials among 17 occupational categories in France has shown that the difference between the lowest (teachers) and highest (unskilled workers) mortality occupations corresponds roughly to the past 80 years of progress in the reduction of the national mortality level. 61/ In developing nations, variations are generally even greater; it is not unusual to find differentials in the infant mortality rate as large as three to five times between the highest and lowest risk groups, when the national population is divided into a few segments with respect to a certain socio-economic characteristic.

Although data on mortality differentials are far from sufficient, especially for adults in developing regions, research results from various countries have been cumulated so that some widely observed patterns can be identified. 62/ Notable mortality variations by the following four kinds of variables seem particularly important: socio-economic status characteristics; urban versus rural area of residence; a group of variables, including ethnicity, religion and geographical location, that are related to intranational cultural diversities; and sex differences.

First, in both developing and developed countries, the lower level of income, shorter period of education and manual-labour occupation tend to be associated with the higher risk of death and ill health. The underprivileged, trapped in poverty, are disadvantaged at different stages of the disease process. They are generally more susceptible and less resistant to diseases, in part owing to less access to immunization services, in part owing to malnutrition including protein-energy insufficiencies and imbalances in diet, and in part owing to deficient housing facilities that do not provide enough protection from heat, cold, wind and rain. Poor facilities of environmental sanitation in households and communities, including supply of drinking water and waste disposal and sewage systems, raise the frequency of exposure to bacteria, viruses, parasites and vectors. The cost of medical services as well as the inequitable distribution of health services in favour of rich residential areas keeps the poor from receiving adequate treatment for disease and injury. Lack of knowledge about proper health care is conducive to a further increase of their disadvantage at every stage of the disease process. In addition, as far as infants and very young children are concerned, women of low-income families with little educational background tend to start childbearing at very young ages, have short birth intervals and give high-order births, all of which are considered to raise the risk of death of their children and themselves.

Secondly, with respect to geographical variations, mortality has been found significantly higher among rural than among urban residents in developing countries, although differences are minor in developed nations and do not allow generalizations about the direction of the association. 63/ The excess of rural over urban mortality is partly attributable to the differential distribution of socio-economic characteristics in urban and rural areas. Better-educated and higher-income people live in greater proportion in cities. The urban/rural differences therefore diminish significantly by a statistical control of socio-economic characteristics, though in some countries the remaining differences are not negligible. The remaining urban/rural differentials, if substantial, may be a result of the strong tendency in developing countries for health manpower and facilities to be concentrated heavily in major cities. The fact that the urban population is better provided with basic community amenities such as a clean water supply and a sanitary system of waste disposal and sewage seems also conducive to the lower urban mortality, 64/ although there are some counteracting factors such as increased density and pollution in cities.

Thirdly, in addition to the urban/rural differences, remarkably large mortality variations among geographical locations such as districts and provinces as well as considerable differentials by ethnicity and religion have been found in some developing countries, particularly in Africa. 65/ Their differentials are often more prominent than urban/rural differences and remain substantial after the impacts on mortality of socio-economic characteristics are taken into account. Differentials by location, ethnicity and religion are considered strongly interrelated in the nations where a variety of tribes and ethnic groups reside separately in different geographical areas. One plausible explanation of the differentials is that membership in groups that are bounded by language, culture, physical appearance and geographic locations of residence imposes the boundaries of the distribution of health-related habits and practices and the diffusion of information on health and diseases.

Finally, excess male over female mortality has been very widely observed. Success has not been attained in decomposing the excess attributable to the different physiological composition and that resulting from different sex roles and life styles in societies. However, if the almost universal excess is found to be virtually non-existent or even reversed, it is a symptom of serious deprivation of women. Higher mortality of female over male children is widely observed among developing countries, 66/ particularly in the South-Asian region. 67/ This may be related to the lesser importance attached to girls by parents who had preferred to have boys. 68/

It is very difficult to eliminate mortality and morbidity differentials through efforts of the traditionally defined health sector alone, in the presence of inequalities in other aspects of economic and social affairs. Some studies in developed nations have suggested that the differential mortality is related to socio-economic differences in life-styles and attitudes towards health, which are not easily manipulable by health policy planners. 69/ Furthermore, the large magnitude of intranational mortality variations particularly in developing nations reflect the vast differences among social groups in standards of living and the inequitable geographical distribution of benefits of economic and social development. Nevertheless, the high mortality of the underprivileged, especially in rural areas, suggests that a potential of significant reduction of differential mortality and morbidity rests in a shift of the focus of health care from expensive curative treatments applicable to only a small segment of the population to the wider coverage of the largely neglected people with basic, low-cost preventive services. This is illustrated by mortality reduction in mortality levels and differentials in Costa Rica, resulting from a policy focusing on the less privileged segments. 70/

Observed patterns of mortality differentials may also underscore the significance of health education in developing regions. The greater mortality variations by education than by other socio-economic variables such as income and occupation, together with the large differentials by variables related to intranational cultural differences, suggest the important role of health-related knowledge, relative to financial resources and physical facilities of families, in reducing mortality and morbidity. This is compatible with the fact that it is possible to avoid many current deaths by adopting relatively simple and low-cost means such as breast-feeding, oral rehydration of diarrhoeal patients, washing hands before meals and boiling drinking water, and cutting the umbilical cord aseptically.

Lastly, it should be noted that some variations in mortality may be indicative of changes in family relationships that are induced by economic and social development. The education of the mother is often the single most powerful factor in the multivariate analysis of infant and early childhood mortality data. The strength of the factor has been discussed as indicative of changes in women's role and status within the family that are brought about by their attainment of higher education. 71/ This seems to suggest that more light needs to be shed on the important role of the family as a unit for self-reliance in health care.

HEALTH POLICIES AND THEIR EFFECTS ON MORTALITY

Curative programmes and preventive programmes

In recent years there has been a growing recognition of the importance of preventive health programmes. In the developed countries, where degenerative diseases predominate, there is strong evidence that changes in life-style can contribute to the prevention of these diseases, or postpone their onset. Once established, the diseases can be difficult and costly to treat. In several developing countries, there is evidence from small-scale field studies that the introduction of modern curative services into high-mortality settings without considering the hygienic conditions and nutritional status of the population may have a small or negligible effect on health. 72/

In 1974, the World Population Plan of Action implicitly stressed a preventive approach, calling for, inter alia, "eradication, wherever possible, or control of infections and parasitic diseases, undernutrition and malnutrition; and the provision of a sufficient supply of potable water and adequate sanitation" (para. 24(d)); "improvement of poor health and nutritional conditions which adversely affect working-age populations..." (para. 24(e)); and "adoption of special measures for reducing mortality from social and environmental factors..." (para. 24(f)). The components of primary health care as formulated at the Alma Ata Conference 73/ also reflect the goal of achieving a better balance between preventive and curative aspects of health programmes. However, a high percentage of actual expenditures for health programmes in developing countries have typically been for curative services. In recent years, there have been widespread changes in the formulation of health policy in many of these countries, with greater emphasis on primary health care and preventive programmes, but, as indicated below in the section on "Primary health care", the extent to which these programmes will be implemented remains in doubt because of political obstacles. 74/

In considering the merits of preventive and curative programmes, however, one must take care not to create an artificial dichotomy between the two, as the distinctions between them are sometimes blurred and both have important roles to play in maintaining a healthy population. In determining the most suitable mix of preventive and curative programmes for reducing morbidity and mortality, countries must take many factors into account, including their age-and-cause structures of mortality, their health infrastructure and the resources that can be allocated to health programmes. Because of the complexity of these factors, and in many less developed countries the lack of data and experience from which to make rational choices, it is not an easy task for these countries to select the most appropriate and cost-effective means of achieving health-related goals. (Relevant to this problem, the World Population Plan of Action recommends the interchange of experience among countries in preventing and treating diseases (para. 26)).

Because the health problems of the developing countries differ greatly from those of the developed countries, it is useful to examine the two groups of countries separately in considering the potential impact on mortality of different types of programmes. Certain generalizations emerge from an analysis of the mortality experience of the developing countries in relation to specific preventive and curative technologic approaches. An important element in their effectiveness is their breadth of coverage, i.e., their ability to reach large segments of the population. In the case of malaria, for example, in areas where the disease is endemic, the use of insecticides can have a major effect on the mortality level in the population. 75/ Even where mass spraying is not applied, there is evidence that the wide availability of chemotherapy and chemoprophylaxis can keep mortality rates below levels expected without treatment. 76/ If family-planning programmes are considered from the standpoint of technologies for mortality reduction, there is considerable evidence that they can contribute substantially to maternal and child survival by affecting the age-parity structure of childbearing as well as birth spacing. 77/

Vaccines represent one of the most effective disease-prevention technologies available, and have the potential to eradicate a disease with a measurable demographic impact when applied on a global scale, as was the case with smallpox. 78/ Currently, there are three diseases - neonatal tetanus, pertussis, and measles - which contribute significantly to childhood mortality and which are amenable to prevention by immunization. In most developing countries, however, little impact has been made on mortality from these diseases because of low coverage of the population by vaccine programmes (in the range of 10 to 30 per cent). 79/

Another area that is amenable to a medically focused approach is maternity care during childbirth. Strategies to ensure that deliveries are attended by a trained practitioner with some basic surgical backup in case of complications can reduce perinatal and maternal deaths significantly.

A more recent strategic approach to mortality reduction is the home use of effective therapies. The main therapy so far subjected to population-wide field testing has been oral rehydration to prevent deaths from acute diarrhoeal disease. While this therapy is highly effective in preventing a fatal outcome from an episode of acute dehydrating diarrhoea, including cholera, its impact in saving lives in a population living under adverse environmental and nutritional conditions has been questioned. 80/ An illustration of the problem is the contradictory findings of two different controlled field trials in rural Egypt, one of which showed a definite reduction in acute diarrhoea and total mortality over a six-month period in several small populations where mothers were intensively instructed by health professionals, while the other showed no effect on mortality in a larger population where mothers were given simple instruction along with packets of oral rehydration salts. 81/ Elsewhere, in areas as diverse as Bangladesh and Costa Rica, 82/ significant reductions in diarrhoea deaths following the distribution of oral rehydration salts to populations have been reported.

Regarding the popular dissemination of other potentially life-saving therapies there has been a clear demonstration of the life-saving effect of the use of penicillin to treat pneumonia by auxiliaries in a properly designed vertical programme. 83/ While this strategy has been proposed for broader use, so far it has not been endorsed by the medical profession in the less developed countries. This restriction on wider use of a few effective drugs in less developed countries which are underserved by qualified professionals represents a paradox, since in these same countries pharmaceutical sales are, for all practical purposes, totally uncontrolled. Thus, antibiotics as well as other drugs are usually dispensed by untrained persons, exposing the population to all of the risks but few of the benefits.

Moving beyond specific disease-oriented technologies, one comes to improvements in nutrition and sanitation. Nutrition interventions, specifically "vertical" feeding programmes administered by health or welfare agencies, can be considered either as a preventive or as a curative strategy, depending upon how the target groups are selected. While some small-scale research projects directed towards infants or pregnant mothers have demonstrated measurable health impacts, there is little evidence that large-scale feeding programmes are beneficial. 84/ Improvements in sanitation, except in urban areas where water and sewer systems may be installed, are basically dependent on personal hygienic practices in the home. Thus, effective strategies for tackling these two problems require broader intersectoral approaches addressing factors such as economics, education and agriculture.

It seems reasonable to conclude that in high-mortality countries broad coverage of the population by the most effective and economical elements of both curative and preventive strategies is essential for achieving large mortality declines, as has occurred in China or Sri Lanka. 85/ In contrast, where resources have been concentrated in sophisticated curative facilities serving only a small subsegment of the population, as is particularly prominent in many parts of Africa, no mortality impact is likely to be forthcoming. 86/

In the more developed countries it is useful to look separately at two subgroups of the population, infants and adults. Regarding infant mortality, evidence from several countries indicates that direct interventions through active programmes to provide every pregnant woman and new-born infant with the best quality of medical care, using a variety of new technologies can reduce infant deaths to very low levels. 87/ Among adults, where most of the deaths in the more developed countries occur, the role of curative medicine is far less important than are changes in life-style, the key elements of which are cigarette smoking and alcohol misuse, and diet and exercise. 88/ Of these, cigarette smoking deserves special attention because there is evidence that it is the largest single preventable contributor to mortality. 89/

Regarding life-style, one analysis in the United States of the 10 leading causes of death over age 1 year in 1975 estimated the average proportional allocation of contributing factors to mortality as: life-style, 48.5 per cent; hereditary or biological factors, 26 per cent; environmental factors, 16 per cent; and the medical system, 11 per cent. 90/ An indication of the relevance of life-style to longevity in the more developed countries comes from one study which indicated that 45-year-old men who followed seven healthful habits (exercising regularly, maintaining moderate weight, eating breakfast, not snacking, not smoking, drinking moderately and sleeping seven hours each night) could expect an average of 11 more years of life than those following three or less of these habits. 91/

One problem area where life-style change enforced by legislation can have a dramatic influence is deaths owing to violence. 92/ As an example, the United States has homicide rates 10 times higher than the United Kingdom, primarily because of lack of laws controlling the personal use of guns. Regarding fatal automobile accidents in the United States, there was an immediate measurable drop in 1974 following the reduction of the speed limit (because of the oil crisis), while in Japan and the United Kingdom low and declining rates can be directly attributed to strict control of alcohol consumption among drivers.

The emphasis on life-style changes does not detract from the important contributions that medical technology has made, and will continue to make, in the control and management of the degenerative diseases in a variety of ways, including early detection and diagnosis; the control of risk factors through medications, such as the new anti-hypertensive drugs; the reduction in mortality of some types of cancer and cardio-vascular diseases through a variety of interventions; and the improvement of the quality of life of persons suffering from various chronic diseases.

Primary health care

One of the fundamental principles underlying primary health care as expressed in the Declaration of the International Conference in Alma Ata, 1978, is that health care should be accessible, affordable, and socially relevant. 93/ Action taken by countries to translate this principle into policies and programmes has so far produced very variable results, ranging from dramatic mortality reduction to disappointing impacts. 94/ This raises a host of issues which can be divided broadly into two questions: first, what are the critical elements of a primary health care strategy necessary for achieving a health impact; and, secondly, to what degree can any direct health intervention strategy be effective independently of the general social and economic context in which it operates? The first set of issues will be addressed here, focusing largely on the less developed countries 95/ and the second set will be addressed below, in the section on "Health care system and total social system".

Primary health care strategy is characterized by some basic elements, including: active community participation; involvement of other development sectors, such as education and agriculture; provision of curative, preventive and health promotion services in a manner socially relevant to the local context; extensive use of paramedical personnel; and use of simple but effective technologies. These elements are discussed below in reverse order. The World Population Plan of Action, prior to the Alma Ata Conference, anticipated many of these strategic perspectives by noting that health programmes should "be integrated within a comprehensive development strategy" with "formulation of policies to widen their coverage" (para. 25), and, regarding health manpower, should "redistribute functions among the different levels of professionals and auxiliaries..." (para. 29(f)).

With respect to technologies used in the primary health care approach, it should be recognized that the most powerful disease-prevention "technologies" are actually the fundamental necessities of life: pure water, good diet and adequate clothing and shelter. Modern medical science has added many more - vaccines, insecticides, antibiotics, oral rehydration and contraceptives, among others. The problem is making these accessible, affordable and acceptable (socially relevant) to the general population.

The most direct step taken to reach the people where they live has been the use of some type of a community-level health worker as an extension of the formal health system. This has a long historical precedent in the compulsory health programmes in most less developed countries, with the use of sanitarians, vaccinators and malaria workers, but the real lead in the use, as a national policy, of auxiliaries to provide a wide range of preventive and curative services was taken by China with the "barefoot doctor" programme in the 1950s. For other less developed countries, one turning point in considering this strategic approach seems to have come with the "deregulation" of contraceptive technologies beginning in the late 1960s, permitting auxiliaries to provide them at the village and household level without direct medical supervision.

The recent successes of a highly focused community- based distribution of contraceptives in some countries, for example Indonesia and Thailand, has led not only to the rapid expansion of this approach in many other less developed countries but also to a growing movement to add to this delivery system a package of other medical technologies such as oral rehydration, vitamin A, iron tablets, antihelminthic drugs and antimalarials. 96/ In Indonesia, the National Family Planning Programme is undertaking the most ambitious effort of all by adding to the family planning field workers' tasks a complete nutrition programme designed to include monthly weighing and growth charting of all children in the community, nutrition, education, vitamin and iron supplementation activities and home gardening. 97/

Community-based distribution programmes are specifically designed to achieve the primary health care goal of mass coverage of the population and some have shown a definite impact on fertility, but at this stage there are some conditions that impose limitations on the programmes' mortality impact: (1) they are basically technology-oriented rather than directed towards more holistic strategies to root out the basic causes of high mortality; (2) the range of specific and effective morbidity/mortality control technologies actually available for this limited strategy is not very broad considering the multiple risk factors for death; (3) the strategies largely depend upon a "demand" for modern medical technologies, which may not exist in some cultures; and, finally, (4) community-based distribution programmes so far being implemented depend heavily on external subsidies (national and often international) for their viability, rather than on local community initiative and support.

Many health ministries, however, are going beyond the narrow technological approach of a community-based distribution activity and developing more comprehensive primary health care programmes with workers trained both to provide simple curative and preventive services and to promote general health at the household and community level. Where this is part of a decentralization of health services based on an overall egalitarian philosophy, the approach can be highly effective in reducing mortality; this has been seen in China and in Costa Rica, where such an approach has recently been initiated. The impact, however, has been marginal in many less developed countries, owing partly to the lack of a commitment of significant national resources to this strategy, best manifested by the expectation in many countries that the primary health care workers will work as volunteers, with no financial rewards. 98/

To turn to the issue of social relevance, the evidence seems strong that where different societies have their own traditions of disease prevention and sickness care, the introduction of the concepts and technologies of modern scientific medicine will have its most effective impact through an adaptation and accommodation to these existing systems. 99/ The classic example that is widely acceptable is the training of traditional midwives to use aseptic techniques and to recognize signs of impending pregnancy complications that require special attention. In fact, a basic problem facing the existing very limited rural health facilities in many less developed countries is underutilization of the services available in spite of a heavy disease burden in the population, in large part because of traditional beliefs about the causes of and cures for diseases. It is apparent, however, that the

"Westernized" medical professional leadership in many less developed countries is far from a consensus on the acceptability of any strategy to integrate the modern scientific and traditional medical systems to best serve the health needs of the populations of those countries, judging by the virtual absence of any consideration of this factor in most national health programmes. 100/

Discussions earlier in this paper about the intimate connection between levels of mortality and social and economic development highlight the importance of an intersectoral strategy in primary health care to get at the basic causes of high mortality. Again, experience in the less developed countries indicates that where a multifaceted approach to social welfare is part of broad national policy, intersectoral strategies naturally follow. By contrast, when primary health care is essentially added as another vertical appendage to a health ministry where all lines of authority are highly centralized, even intraministerial co-ordination may be difficult to achieve, not to speak of intersectoral co-operation. Unfortunately, broad intersectoral participation in primary health care has, so far, seldom been seen in many less developed countries.

A prime element of primary health care strategy is community participation: if social welfare is to be effectively improved it must involve the people in making their own decisions and taking their own actions. A key element in the success of primary health care in China is a very small central bureaucracy which communicates effectively with all regions of the country but is concerned basically with policy decisions. The local units have total responsibility for deciding how the policy will be implemented and when, where and by whom, and obviously, control of their local resources for the implementation activities. 101/

It is interesting to observe that the successful small-scale primary health care experiments, covering a few thousand persons, that have been carried out in a number of less developed countries have been de facto locally managed and more likely to involve approaches appropriate to the village conditions. In fact, a recent review of 10 of these projects stressed this fact as a vital element in the degree of impact achieved. 102/ Perhaps not surprisingly, when much-larger-scale primary health care research projects have been attempted, covering several hundred thousand persons with essentially the same package of technological approaches but with a much more remote centralized management, little or no impact on mortality and morbidity has been documented. 103/

Based on these experiences, it seems reasonable to conclude that the lack of community participation is an important factor in the weak performance of primary health care in many less developed countries. While some health administrations are attempting to overcome this constraint, there are at least two formidable barriers: the first is that many health systems are already locked into an urban-biased, hospital-based, high-technology system that is essentially self perpetuating, administratively and politically; 104/ the second is the frequent lack of political or administrative institutional structures at the community level which can effectively assume this type of responsibility.

While problems that countries are facing in attempting to implement primary health care programmes are often deeply rooted and difficult to solve through efforts of the health ministeries only, they should not be interpreted as signifying an inherent weakness in the primary health care concept. Rather, this only highlights the accuracy of the introductory statement in the World Population Plan of Action that "the basis for an effective solution of population problems is, above all, socio-economic transformation" (para. 1). Social change is always difficult; yet it is integral to the effective implementation of primary health care programmes in most less developed countries.

IMPLEMENTATION OF HEALTH POLICIES

Health care system and total social system

In considering the goals of achieving a better quality of life, the Background to the World Population Plan of Action clearly notes that human welfare cannot be divorced from the national and international social and economic contexts, viz. "...the present situation of the developing countries originates in the unequal processes of socio-economic development... This inequity sill exists and is intensified by lack of equity in international economic relations ..." (para. 4). The Plan also sets out a series of principles on which human welfare and development should be based, such as "dignity of the individual, appreciation for the human person and his self-determination"; it observes that "population policies ... should be consistent with ... human rights of individual freedom, justice ..." and that "in the democratic formulation of national population goals and policies ... attention must be directed to the just distribution of resources ..." (para. 14 (b), (d) and (j). As is documented elsewhere in this paper, the levels of health and mortality in various countries are usually sensitive indicators of the degree to which societies have been able to apply these principles in the course of their development.

Recognizing that health levels are a consequence of the functioning of the socio-economic system leads directly to the issue of the health system's relative dependence on or interdependence with the overall social system. This issue can be looked at from different perspectives. An examination of the structure of the health systems among both developing and developed countries - whether oriented towards the equal distribution of benefits to all citizens or with an allocation of resources skewed to benefit an urban élite - shows that national health policies are generally consistent with national policies in all other sectors of development. 105/ For example, for Latin America the "underdevelopment of health" has been ascribed to the "health of underdevelopment", that is, "the present maldistribution of human health resources is brought about by the same determinants that cause underdevelopment of Latin America." 106/

The obvious reason for the close connection between the formal health system and the socio-economic system relates to the fact that the allocation of resources by Governments is determined by the power relations in the society. In so far as the formal health system is primarily supported by government expenditures, these will be allocated according to the priorities of those with the power over the political system. For the majority of the developing countries, these are Western-educated élites that design a health system which will meet their perceived needs. Thus most countries adopt a Western model with sophisticated urban hospitals which consume most of the resources, leaving little for basic preventive measures to reach the masses.

It should be noted that a more egalitarian distribution of health services can be achieved under quite different political systems, as is evident from a comparison between Cuba and Costa Rica, in the context of Latin America. Both countries have directed special attention to providing medical and related social services to all of their populations and both now have comparable levels of life expectancies (for 1980: Costa Rica, 72.5; Cuba, 72.7) and infant mortality rates (for 1979: Costa Rica, 21.1; Cuba, 19.4). 107/ This point was reached, however, by very different paths of development and with widely different political systems. In the fifties both countries had relatively low levels of mortality in comparison with many other countries of the region. Cuba placed priority on the distribution of social benefits, even at the expense of economic growth, from the establisment of the present régime in 1959. However, in Costa Rica the most active efforts to extend health services to all sectors of the population began in 1973, in a favourable economic context.

Another dimension of the relationship of the health system with the overall social system is the prevailing ideology of the society; that is, whether it emphasizes hierarchical relationships, or individual responsibility, enterpreneurship, political participation and egalitarian social relationships. 108/ An example of the importance of these factors is India, a large and socially very heterogeneous country where the individual states have considerable autonomy. In that country there is great diversity among states in the structure and operation of the health system, depending upon the power relationships within the society, in spite of the uniform policy at the national level. 109/

A discussion of the relationships between the overall social system and the health care system would be incomplete without reference to the socialization process which occurs within the medical profession itself and which often has a dominant influence on the structure of the organization of medical services. Western medical education prevalent in most countries transmits not only scientific knowledge but a whole set of values. These are usually dominated by: the priority of biological sciences over social concerns; an indoctrination that the challenge of medicine is the "interesting case" in the hospital, rather than the sick people in the community; an authoritarian approach in human relations; socialization to expect an upper-class life-style; and a conservative reaction to proposals for social change that may threaten the élite position of the profession. While not all members of the medical profession share these values, they do represent a mainstream position of Western medicine that crosses international boundaries and is influential in health systems world wide.

There always has been tension, however, within the medical profession and the larger society between the forces that are moving the health system towards ever more costly sophisticated individual care and those that are looking more broadly at community health needs. This is continually occurring in developed as well as in developing countries, and is generally driven by two forces: the rising costs of curative care and the perceived decline in community health and social benefits being derived from the trends towards increasing technologic sophistication. Generally, in so far as societies have the capabilities for assessing changing health conditions, and the freedom for open debate on the issues with broad public participation in the decision-making process, there is the possibility of an evolution of the health system to meet the real human needs.

Health care management and planning

For health policies to be successfully implemented, the process of production, allocation, utilization and organization of health resources, including manpower and physical facilities, needs to be adequately planned and administered. The significance of appropriate management in population activities is stressed in the World Population Plan of Action as follows: "There is a particular need for the development of management in all fields related to population, with national and international attention and appropriate support given to programmes dealing with its promotion" (para. 81). With respect to health care management, it should also be noted that the International Conference on Primary Health Care in Alma Ata, 1978, recommended that "Governments should develop the administrative framework and apply at all levels appropriate managerial processes to plan for and implement primary health care, improve the allocation and distribution of resources, monitor and evaluate programmes with the help of a simple and relevant information system, share control with the community, and provide appropriate management training of health workers of different categories". 110/

However, as described in the Global Strategy for Health for All by the Year 2000, which was adopted by the Thirty-fourth World Health Assembly, "deficient planning and management, including inadequate co-operation with other social and economic sectors, is another affliction of health care delivery systems in many countries." 111/ Especially in the severely underdeveloped countries, all too often the health plans are deadlocked in the field and remain largely on paper. It is not unusual to observe such instances as the construction of health centres being postponed for long periods or indefinitely and "nationwide" campaigns for vector control not appearing to reach remote areas. Various problems underlie such difficulties in implementation, and some highlights of those problems will be discussed below.

An important component of health action is the training and distribution of health manpower; and, given the labour-intensive nature of health care, manpower consumes a large proportion of the health budget in many countries. A shortage of health manpower relative to health conditions of populations concerned is a problem that continues to plague many developing countries. 112/

Furthermore, the scarce human resources are geographically distributed in a very inequitable way. This is partly because of the relatively low priorities in health planning given to remote areas, partly because of the unwillingness of the health personnel to work in relative isolation in the living and working conditions of the deprived areas, and partly because the Westernized training received by the health personnel often concentrates on providing specialized medical care in large hospitals with modern equipment, not necessarily providing them with adequate preparation for working in such areas. The result has been the serious shortage of health manpower in rural areas.

In addition, much less emphasis has been placed on the production of health workers other than physicians, such as medical assistants, nurses, midwives and other kinds of auxiliaries, resulting in imbalances in the overall composition of the health labour force, as shown in the high ratio of physicians to other health workers. 113/ The imbalances indicate an inefficient use of the already limited health fund, when many rural villages are in urgent need of the basic preventive care that can be provided by community health workers at much lower cost than fully trained physicians.

98. Increasing attention has been given in some countries to reducing these problems to some extent by making greater use of traditional practitioners. These practitioners often exert considerable influence on local health practices, and after appropriate training are able to work in alliance with "modern" practitioners to improve the health of the community. 114/

Another aspect of the problem of health manpower supply in developing countries is a recent tendency to produce physicians in greater number than warranted by existing employment opportunities, which are determined within a given structure of health care system under certain budgetary restrictions. This problem results in part from the lack of co-ordination between governmental organs in charge of health, which exert some control over the employment opportunities for physicians, and those in charge of education, which often create and liberalize medical schools as a response to the growing demand for medical education as an important vehicle for social mobility. 115/ As a result, many of the physicians migrate to other countries. A recent study conducted by the World Health Organization has shown that many countries are losing physicians through migration mainly because the countries concerned have more physicians than their economy can sustain. 116/

Utilization of manpower is all too often inefficient. On the one hand, physicians and professional nurses are usually kept busy performing tasks that could be done at much lower cost by the proper use of auxiliary personnel. 117/ On the other hand, there are instances of the reverse direction; for example, expensive and complex equipment is sometimes left in the hands of health personnel lacking satisfactory qualifications for their manipulation.

With respect to the organizational structure of health care delivery systems, many countries are placing growing emphasis on regionalization, i. e., "administrative and budgetary decentralization in order to make the allocation of health resources more relevant to local needs, involve communities in the development and operation of their local services, and simplify bureaucratic procedures." 118/ Many developing countries are making every effort to conform to this approach. Local authorities in some developing countries, however, tend to be very weak and they often lack the financial resources and manpower necessary for the creation of local administrations.

Another organization problem that may undermine the efficiency and effectiveness of health programmes is the lack of co-ordination among providers of health services. This is often caused by the tendency for separate origins of funds to result in separate programmes of health services. Especially in countries with social security health programmes, there have arisen serious rivalries with ministries of health. Since the social security moneys are normally collected through special channels from workers and employers, social security bodies make decisions on their use independently. 119/ Lack of co-ordination may lead to wasteful duplication of effort in some health services, while in other services serious gaps may remain unfilled.

Lack of administrative flexibility in responding to the changing health needs may also jeopardize efficiency in the use of health resources. For example, some countries still maintain hospitals specializing in tuberculosis and leprosy, even after preventive measures have made these diseases relatively infrequent and treatable at the local level. Poor adaptation to the culture and life-styles of the communities concerned may also lead to underutilization of health facilities. For example, in some societies women strongly prefer to consult with or be examined by female health workers, but find only male personnel in their local health centres.

Finally, it should be noted that growing emphasis has been placed on co-operation in health care planning and administration between the health sector and other sectors. In particular, logistic and operational problems that hamper health programmes are often the result of deficient infrastructures, including means of transportation and communication, and supply of basic materials and energy. Over the years there has been an increasing realization that health development is not the affair of the traditionally defined health sector alone, but can be achieved through concerted efforts of many sectors concerned with various aspects of economic and social development.

In summary, successful implementation of health policies is often hampered by (1) scarcity, (2) inadequate allocation and (3) inefficient utilization of health resources. Improvements in health service management and planning have a potential for progress in these three areas, especially utilization of resources.

Health care financing

In presenting its recommendations for action in the area of morbidity and mortality, the World Population Plan of Action set goals and recommended specific measures, but did not mention the financial implications of implementing the measures. Any course of action followed does, nevertheless, have financial implications and these frequently constitute a serious impediment to further reductions in morbidity and mortality levels. Any given measure intended to achieve such reductions must compete for resources with actions directed to other goals, as well as with attempts to deal with other aspects of morbidity and mortality.

It is currently estimated that approximately 7.5 per cent of the total gross national product (GNP) in the developed countries is spent directly on health care. 120/ In countries with a GNP of at least $US 7,500 (there were more than 15 countries in this category in the late 1970s), this would amount to $US 550 or more per person annually. Corresponding estimates for the developing countries are fragmentary and not entirely consistent, but it is probably safe to say that in these countries the percentage of GNP spent on health care is between 2.5 and 7.5. 121/ In the lowest income countries, 2 or 3 per cent of GNP may be on the order of only $US 5-10 per person per year on the average. Since the distribution of health care resources is generally unequal, these figures actually suggest that the amount is much less or even zero for some areas or social groups.

An even more striking contrast in health expenditure between the more and less developed countries as a whole is evident if attention is restricted to public, as distinct from private, expenditures. The distinction is important in that in all countries, but especially in the developing countries, lower-income groups - particularly those living in rural areas - are normally much more dependent on health services based on public funding. As of about 1980, public expenditures for health were estimated to be just over 1 per cent of GNP in the poorest countries, while they were about 4.6 per cent of GNP in the industrialized countries. 122/

To complete this brief overview of existing patterns of financing health care, it should be mentioned that funds from bilateral and multilateral sources have made important contributions to health programmes in the developing countries. It should also be noted that many of the most significant expenditures, in terms of their potential for reducing morbidity and mortality, are not readily calculated as elements of health care. Improvements in the supply of pure water, public sanitation, nutrition and housing and in other spheres are crucial indirect investments for mortality reduction, but are typically decided upon and budgeted in terms of a far wider range of criteria than health consequences alone.

To turn now to the leading unresolved financial issues in mortality reduction, four points are especially noteworthy. First, in a period of increased economic stringency and instability, now being experienced in most countries, relative levels of financial support for health activities tend to become more difficult to sustain. Financial strains do not invariably lead to a deterioration of the effectiveness of health measures; indeed, they may result in changes in the structure of health services - for example, in increased emphasis on primary health care - or in technical innovations that are advantageous in the long run. Frequently, however, a period of economic constraint may make structural changes even more difficult to achieve.

Secondly, even apart from the general state of economic stringency, medical costs themselves during at least the last decade have been escalating at a particularly rapid rate. The evidence indicates that the tendency of medical costs to rise more rapidly than other categories of expenditure is quite general; it is observed in both developing and developed countries with a wide variety of economic systems. Attempts to sustain further reductions in morbidity and mortality and at the same time control escalating costs of medical care are a crucial issue in health policy. Clearly, financial considerations cannot simply be ignored when considering the role of population in general and of mortality in particular as an element in the economic and social development process.

Analyses have been conducted of the reasons for the sharp rise in medical care costs in recent years, particularly in developed countries. The complicated web of causal factors seems to include the following: price inflation; improvements in the quality and intensity of medical services; extension of public and private health insurance coverage to larger proportions of the population; the development of sophisticated and costly diagnostic and treatment procedures (coronary artery bypass surgery, organ transplants, renal dialysis); and the growth of the elderly population, with its greater per capita needs for health care. While the growing prevalence of third-party payment of medical costs leads to the desirable goal of increasing the utilization of health services by disadvantaged groups, it also results in a situation in which neither the provider nor the consumer of such services has an intrinsic interest in controlling costs. 123/

A third issue is the method of financing direct health expenditures. Broadly speaking, health care costs may be met in one of three ways: direct consumer payment for services, some form of insurance, or payment out of existing or anticipated general tax revenues. 124/ In most countries, some combination of these forms of financing is used in actual practice. Given the chronic shortage of health care funds, many countries need to resort to a broad range of support sources. It should be recognized, on the other hand, that excessive diversification of sources of health care financing is often associated with duplication of efforts and lack of co-ordination among health care programmes supported by various sources, relatively large administrative cost and insufficient flexibility to allow health care administrators to allocate the funds to high-priority areas.

Different approaches to health care financing should be assessed, in the light of the idiosyncratic conditions of the country, on the basis of several criteria: efficiency, usually measured as the proportion of the total revenue that is used for administration; flexibility in the management of funds; reliability of the supply of health funds in the presence of changing economic conditions and politically unstable processes of resource allocation.

Various approaches have their own advantages and limitations. For example, social security and private insurance schemes have shown a strong tendency to support modern, hospital-based, doctor-centred curative programmes. Although social security has been widely accepted as a useful approach to health care financing, 125/ its limited population coverage is sometimes criticized. Extension of health programmes to outlying rural areas and utilization of paramedical practitioners, on the other hand, are usually easier under public health authorities. The direct administration of health programmes by the public sector, however, is not without criticism because of its tendency to reduce incentives for health care practitioners. Although communal self-help is regarded as an important complement to other sources of support in various ways, including supply of community labour for construction and maintenance of local health facilities, the principle of local self-reliance may be difficult to implement in societies in which large portions of the population at the lower level of social stratification have always looked to higher levels for support and aid. 126/ The optimal mix of various sources of financing of health services in a country seems to depend on political, economic, social and other idiosyncratic conditions of the country.

A fourth, and final, issue to be noted concerns the importance of financing health care in part through international technical co-operation. The severe limitations on financial resources available for reducing morbidity and mortality in the developing countries have been somewhat overcome in the past by a flow of funds from external sources, as already mentioned. However, it must be recognized that conditions of economic stringency in the richer countries that have been the main sources of such funds may limit their future growth, at least as commensurate with growing needs in the recipient countries. Continuing efforts to sustain international co-operation for reducing mortality and improving health will clearly be called for.

A closer look at the expenditure of internationally provided health funds often reveals that foreign aid and national health policies are not always in harmony. The preference of international donors has largely been for capital investments in health facilities and the introduction of new health programmes, which usually create a need for recurrent funds from internal sources, thereby possibly burdening the recipient country with rapidly increasing operating expenditure obligations. Once recurrent funds have been spent in one area, it is difficult in the following years to redirect the expenditure to other areas, even if they have higher priorities. Continuity and regularity are important requirements for international aid, and both external donors and recipient countries should carefully consider the amount of counterpart funding required from internal sources and the conformity of the funded projects with the order of health priorities of the population. 127/

In the formulation of any global policies in the area of mortality and morbidity, financial implications must at some stage be explicitly considered. The growing recognition given to the primary health care approach is in significant part the result of an awareness of the financial impediments to achieving mortality and morbidity goals in the developing countries by means of the more traditional organization of health services. Of course, primary health care itself cannot be extended without heavy financial commitments. (Estimates of total resources required to finance primary health care to the year 2000 range from just over $US 40,000 million to $US 100,000 million. 128/) In any case, two fundamental propositions clearly call for further consideration: financial implications of policies to deal with mortality cannot be ignored, and more effective means to cope with rising costs of health care are needed, if acceptable progress in mortality reduction is to be achieved.

Notes and references

1/ Report of the United Nations World Population Conference, 1974, Bucharest, 19-30 August 1974 (United Nations publication, Sales No. E.75.XIII.3), chap. 1.

2/ Primary Health Care: Report of the International Conference on Primary Health Care, Alma-Ata, Union of Soviet Socialist Republics, 6-12 September 1978. Jointly sponsored by the World Health Organization and the United Nations Children's Fund (Geneva, World Health Organization, 1978) (hereinafter referred to as Report of the Alma-Ata Conference, 1978).

3/ See "List of papers", annex II to Part One of this document.

4/ Report of the Alma-Ata Conference, 1978, para. I.

5/ For the report of the Symposium on Population and Human Rights, Amsterdam, 21-29 January 1974, see The Population Debate: Dimensions and Perspectives. Papers of the World Population Conference, Bucharest, 1974, vol. II (United Nations publication, Sales No. E/F/S.75.XIII.5). See also Population and Human Rights: Proceedings of the Symposium on Population and Human Rights, Vienna, 29 June-3 July 1981 (ST/ESA/SER.R/51).

6/ According to the classification used by the United Nations Population Division of the Department of International Economic and Social Affairs of the United Nations Secretariat, the more developed regions include Northern America, Japan, Europe, the Union of Soviet Socialist Republics, and Australia-New Zealand in Oceania. The remaining regions are classified as less developed.

7/ Life expectancy values for 1980-1985 are from World Population Prospects: Estimates and Projections as Assessed in 1982 (United Nations publication, forthcoming), table A-15.

8/ The tabulations of numbers of countries according to life expectancy attained by the years 1985 and 2000 are based on life expectancy values that have been interpolated from data for five-year periods given in ibid. Countries with fewer than 300,000 inhabitants in 1975 have not been counted.

9/ World Population Prospects: Estimates and Projections as Assessed in 1982, op. cit., table A-16.

10/ World Health Organization, Global Strategy for Health for All by the Year 2000 (Geneva, 1981), pp. 7-9.

11/ Annex to General Assembly resolution 35/56 of 5 December 1980.

12/ General Assembly resolution 36/43 of 19 November 1981.

13/ World Health Organization, Global Strategy..., p. 31.

14/ World Health Organization, Formulating Strategies for Health for All by the Year 2000 (Geneva, 1979), para. 63; see also World Health Organization, "Taking off into health for all by the year 2000," World Health Statistics Quarterly, vol. 35, No. 1 (1982), pp. 2-3.

15/ Annex to General Assembly resolution 35/56 ... , para. 48.

16/ "General and complete disarmament: comprehensive study on nuclear weapons; report of the Secretary-General" (A/35/392, para. 195). For a brief summary of this report, see The Lancet, No. 8247 (19 September 1981), pp. 628-629.

17/ Tables showing recent trends in expectation of life at birth and infant mortality are presented in the following paper prepared by the Population Division of the Department of International Economic and Social Affairs of the United Nations Secretariat "Recent mortality levels and trends in national populations" (IESA/P/ICP.1984/EG.IV/19).

18/ See Davidson R. Gwatkin, "Signs of change in developing-country mortality trends: the end of an era?," Overseas Development Council, Development Paper 30 (February 1981); see also Levels and Trends of Mortality since 1950: A Joint Study by the United Nations and the World Health Organization (United Nations publication, Sales No. E.81.XIII.3), pp. 3-5.

19/ World Population Trends and Policies, 1981 Monitoring Report, vol. I: Population Trends (United Nations publication, Sales No. E.82.XIII.2), pp. 111-112.

20/ M. N. A. Azefor, "Counteracting forces in the continued decline of mortality in Africa," International Population Conference, Manila, 1981: Solicited Papers (Liège, International Union for the Scientific Study of Population, 1981), vol. 2, pp. 16-18; Levels and Trends of Mortality since 1950 ... , pp. 95-98.

21/ Mortality in South and East Asia: A Review of Changing Trends and Patterns, 1950-1975. Report and Selected Papers presented at Joint World Health Organization/United Nations Economic and Social Commission for Asia and the Pacific Meeting held in Manila, 1-5 December 1980 (Geneva, World Health Organization, 1982); United Nations Economic and Social Commission for Asia and the Pacific, "Mortality decline and health policy: an overview of developing countries of the Asia-Pacific Region," chap. II C of the present document.

22/ See, for example, R. Z. Ling, "A brief account of 30 years' mortality of Chinese population," Mortality in South and East Asia: ... , pp 287-296; J. Banister and S. H. Preston, "Mortality in China," Population and Development Review, vol. 7, No. 1 (March 1981).

23/ National Research Council, Vital Rates in India, 1961-81 (Washington D.C., National Academy of Sciences) (in publication).

24/ See, for example, E. E. Arriaga, "The deceleration of the decline of mortality in LDCs: The case of Latin America," International Population Conference, Manila, 1981 ..., vol. 2, pp. 21-49; A. Palloni, "Mortality in Latin America: emerging patterns," Population and Development Review, vol. 7, No. 4 (December 1981), pp. 623-649.

25/ World Population Trends and Policies, 1981 Monitoring Report, vol. 1 ..., pp. 112-114.

26/ The World Health Organization estimates that roughly half of the population of the developing regions now live in countries characterized by a cause-of-death pattern similar to, if not as pronounced as, that of the more developed regions. See "Taking off into health for all by the year 2000 ... ", p. 5.

27/ See table 3 in the following paper prepared by the United Nations Economic Commission for Africa: "The influence of development-related changes on infant and childhood mortality in Africa," chap. II.B of the present document.

28/ These data are reported regularly by U.S. Department of Health and Human Services in Morbidity and Mortality Weekly Report.

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B. Policies and programmes affecting mortality and health

Secretariat of the World Health Organization*

BACKGROUND

All countries have policies or programmes to improve the health and well-being of their citizens. Health protection and promotion and disease treatment and prevention are in one form or another incorporated into national Governments' development plans. Most less developed countries in the world originally structured their health services along the model which had been gradually developed in the Western industrialized countries, with an emphasis on curative services which are hospital based and largely located in urban areas. Preventive activities and such public health programmes as were available were designed to check the spread of endemic diseases and to prevent outbreaks of major epidemics. In addition, among the preventive activities aimed specifically at improving the health of infants, young children and mothers, there are many pre-natal and family planning services and activities organized either within the health system or as a separate activity through governmental or non-governmental organizations.

With the introduction of modern drugs and pesticides in the late 1940s and early 1950s, the further developments in health services and infrastructure, the increase in the number of health personnel and the launching of major disease control programmes, a rapid reduction of mortality has been achieved in many less developed countries (LDCs). In addition, in some LDCs rapid economic progress and the institution of social welfare policies have led to a general improvement of the health status of the population.

Those developments were not witnessed in all developing countries. Moreover, the pace of mortality decline has not always been sustained. This has led to greater disparities in levels of mortality among the major regions of the world as well as among individual countries within these regions. Even within countries, wide disparities in survival chances continue to prevail among various subgroups of most populations. Such disparities are generally considerably larger in high-mortality than in low-mortality countries. In India, for instance, the range of life expectancy at birth for females among the major states is estimated to be in excess of 20 years; in the Philippines, the interprovincial range is even higher.

At the beginning of the 1950s it was estimated that, of the three major developing regions of the world, Latin America had the highest life expectancy at birth (about 52 years) and Africa the lowest (about 37 years), with the level in the Asian region falling in between (43 years). By the mid-1970s mortality levels in the three major regions had improved and life expectancy at birth was estimated at 62, 47 and 57 years, respectively. The overall figures, however, mask the existence of wide disparities within regions. In Asia, for example, they ranged between 69 years (Sri Lanka), the highest national life expectancy, and 42 years (Bhutan and Afgahnistan). The variations in mortality levels within countries - among administrative or geographical regions or between rural and urban areas - are associated not only with variations in the availability of and access to health services, but also with variations in socio-economic status reflected in income, housing conditions, education, water and sanitation. In high-mortality regions, infant and young child deaths account for a large proportion - often as much as 50 or 60 per cent of all deaths. Differentials in infant mortality also arise from factors associated with uncontrolled fertility, especially short birth intervals, and childbearing at the extremes of the reproductive span.

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Marked differentials in mortality are also evident among population subgroups in the industrialized countries, where mortality levels are much lower. The gap in life expectancy at birth between the sexes is currently about five to six years in favour of females in many European countries and considerably higher, around eight to ten years, in Northern America, the Soviet Union, Finland, Poland and France. The socio-economic circumstances of individuals are closely related to survival prospects. In the United Kingdom, for example, where socio-class differentials in mortality have been demonstrated for over 100 years, it is estimated that males belonging to social class I (wealthier) can expect to live about seven years longer than males born into the lowest social class (V). This differential is of the same order as the gap in life expectancy at birth for males in, for example, Portugal and Sweden, countries which are representative of, respectively, the lowest and highest levels of life expectancy in Europe. More importantly, the differentials in mortality between social classes appears to have widened in the face of mortality decline in some countries.

Recent trends of mortality in the developed world also point to the widespread failure of adult males to register further substantial increments in life expectancy. Indeed, life expectancy for adult males in several Northern European countries has hardly changed at all since the early 1950s, when the rapid decline in death rates from the communicable diseases effectively ceased. Moreover, life expectancy for men has been declining in several Eastern European countries during the last decade or so. In general, females have continued to register further gains in life expectancy, with the level approaching 80 years in many (predominantly Northern European) countries.

Against that background, some of the policy options which could be expected to ameliorate these differentials and unfavourable trends of mortality are discussed in this paper. It is recognized, however, that mortality levels, trends and differentials are to a very large extent determined by policies and programmes not directly the responsibility of the health sector. Food availability, women's status and role, education, income levels and distribution and alleviation of poverty are the most obvious examples. This sensitivity of mortality levels and differentials to the impact of broader social, economic and cultural influences has been found to apply in low-mortality countries as well. However, the most significant impact in this respect, and also in respect of morbidity, is often achieved through policies and programmes in the health sector. These can be specific, such as a malaria-eradication programme or a vaccination campaign, in which case the impact tends to be easily identified; or they can be more general, such as water and sanitation programmes or a health education drive, where the health impact on the population will be more gradual and difficult to measure. No attempt has been made here to explore specific policy options for reducing many differentials in ill health which exist among human populations, either within or between nations.

A historical turn in health development occurred in 1977, when it was decided unanimously by the Thirtieth World Health Assembly in resolution WHA30.43 that by the year 2000 all people in all countries should have a level of health that would permit them to lead a socially and economically productive life. This implies that the level of health of all people should be at least such that they are capable of working productively and of participating actively in the social life of the community in which they live. Health for all does not mean that in the year 2000 doctors and nurses will provide medical services for all the existing ailments of everybody in the world; nor does it mean that in the year 2000 nobody will be sick or disabled. It does mean that health begins at home, in schools and in factories; it is there, where people live and work, that health is made or broken. It does mean that people will use better approaches than they do now for preventing disease and alleviating unavoidable diseases and disabilities, and will have better ways of growing up, growing old and dying gracefully. It does mean that there will be an even distribution among the population of whatever resources for health are available. It does mean that essential health care will be accessible to all individuals and families in an acceptable and affordable way, and with their full involvement. And it does mean that people will realize that they themselves have the power to shape their lives and the lives of their families, free from the avoidable burden of disease and aware that ill health is not inevitable.

In conformity with the recognition by the United Nations General Assembly of health as an integral part of development, 1/ the human energy generated by improved health should be channelled into sustaining economic and social development, and economic and social development should be harnessed to improve the health of people. Health for all by the year 2000 cannot be achieved by the health sector alone. Co-ordinated efforts will be required of other social and economic sectors concerned with national and community development, in particular agriculture, animal husbandry, food, industry, education, housing, public works and communications. Ministries of health or analogous authorities play an important role in stimulating and co-ordinating such joint action for health.

Evaluation of the impact of the 1974 World Population Plan of Action 2/ and of WHO's new Global Strategy for Health for All by the Year 2000, 3/ will be greatly facilitated by the agreed procedures for monitoring the progress and evaluating the efficiency of the strategy. These procedures, which involve individual country reports being reviewed by the WHO regional committees and regional reports being reviewed by the World Health Assembly at regular intervals starting in 1983-1984, are likely to lead to dramatic improvements in the quantity and quality of available health data. This would include information on national health policies and strategies; on managerial measures to develop and implement them; on health systems based on primary health care, including health manpower, community involvement, co-ordination within the health sector and with other sectors, and the delivery of health care; on health research; on co-operation among countries and between them and WHO; and on mobilization of resources; as well as an assessment of the world health status and related socio-economic situation. Some of this information will be based on the 12 global indicators 4/ that were decided upon by the Health Assembly. The assessment will also be facilitated by the results from the 1980 round of censuses as soon as these become available in sufficient detail to permit a comprehensive evaluation.

Developing countries constitute a very heterogeneous group, with regard not only to the level of health development, but also to many other sectors, such as political systems, economic development and the organization of health care, all of which interact with, and hence influence, health status. This paper is largely focused on one region of the world - South and East Asia, whence most of the examples are drawn - although the same type of considerations would doubtless apply in other regions of the world at similar stages of mortality transition.

HEALTH POLICIES, ECONOMIC DEVELOPMENT AND MORTALITY

Major health problems

The overall mortality level is largely determined by the age structure of mortality, which in turn depends upon the prevailing cause of death patterns. Deaths among infants and young children in the developing countries are overrepresented when compared with the situation in the developed countries. Further, for the latter group of countries the modal ages of deaths have moved more and more to the extremes of the life span. This is a consequence of the progress in maternity and child care, which has ensured the survival of infants who previously would have succumbed to various congenital disorders and injuries at birth. At the other extreme, technological advances in medical care for adults and the elderly have led to an increasing "rectangularization" of the survival curve at the higher ages.

At the risk of over-simplification, the reduction of mortality may be said to result from either or both of the following processes: (a) reduction of the exposure to risk of illness through such methods as improved sanitation and immunization, but also through improving nutritional status and personal hygiene, providing potable water, etc.; (b) introduction of more effective treatment, resulting in reduced case-fatality, such as oral rehydration for acute diarrhoeal cases.

Past experience has shown that the effective control of "preventable deaths", that is, those caused by infections and parasitic diseases, diarrhoeal diseases, most respiratory diseases and maternal mortality represents the path of mortality change which brought about the present longevity levels in the low-mortality countries. In contrast, the persistence of these broad groups of causes of death in developing countries is largely responsible for the low levels of life expectancy. One study of regional differentials in mortality in the Philippines has shown a close inverse association between the estimated level of life expectancy at birth (both sexes) and the percentage of registered deaths attributed to the most frequent types of infections and parasitic diseases, and a positive association with cancer deaths. 5/ In general, deaths resulting from causes of the first kind have a tendency to decline with increasing life expectancy, while deaths attributed to cancer display the opposite tendency. For most countries, however, information on causes of death is either not available at all or limited to deaths which occurred in hospitals which are known to be highly selective. Some insights into the health problems facing less developed countries may be gleaned from the reports submitted by national Governments to WHO. Summary data presented in table 1 indicates that in most low-income, high-mortality countries, the general pattern of major health problems did not change markedly during the 1955-1975 period. Smallpox and plague, and in some instances tuberculosis, are no longer mentioned but, by and large, infectious - especially respiratory and gastrointestinal - diseases still pose the major health problems. An item more often mentioned in the 1975 list is malnutrition - indirect evidence of the increasing proportion of the population living in conditions below the "poverty line" in many developing countries. The World Bank has estimated that about 1 billion people were living in absolute poverty in 1980, the majority (as much as 90 per cent of the absolute poor) living in rural areas and working on farms or doing non-farm work depending in part on agriculture. More than half of these people were small farmers owning some land and/or leasing land. Large pockets of absolute poverty are often found in relatively remote areas which are underserved with regard to education and health infrastructure and services. This is not to suggest that malnutrition is a problem confined to the poor living in rural districts; malnutrition affects urban dwellers and their children as well. Urban living conditions - notably the squalor of the slums in which most new migrants tend to cluster - often appear to challenge the notion that rural-urban migration reduces poverty. A study of differential child mortality in Bangladesh found that the families of immigrants from rural to urban areas have higher child mortality than comparable (in terms of education) urban-born families. The lack of a family support system in the new urban environment contributes to this differential as does the lower disposable income of recent arrivals. 6/

By contrast the leading causes of death in the developed countries are the so-called diseases of civilization, for which the aetiology is closely related to individual life style. Ischaemic heart disease, the leading cause of death in developed countries, accounting for about one fifth of all deaths on average, is much more common in individuals who smoke heavily, exercise little, are obese and have high blood pressure and abnormal blood lipid distribution - all of which, with the exception of cigarette smoking, are to a considerable extent influenced by poor dietary habits. An unhealthy diet has also been implicated as an aetiological agent in cancers of certain sites of the digestive tract. A further 4 per cent of deaths in the developed countries are the result of cancer of the lung for which cigarette smoking is the major causal factor.

Table 1. Major health problems in selected developing countries around 1955 and 1975

Region and country	Major health problems around 1955	 around 1975
Latin America		
Bolivia	Malaria Tuberculosis Yellow Fever Smallpox Typhus	Respiratory diseases Gastrointestinal diseases Tuberculosis Undernutrition Sanitation
Colombia	Malaria Typhoid and paratyphoid fever Syphilis Smallpox	Malaria Meningococcal maningitis Acute poliomyelitis Heart and cerebrovascular diseases Malignant tumors
Costa Rica	Malaria Leprosy Poliomyelitis Tuberculosis	Venereal diseases Measles Pertussis Tuberculosis Viral hepatitis
Mexico	Malaria Yellow fever Syphilis Tuberculosis Leprosy	Gonorrhoea Leprosy Cancer Accidents
Oceania		
Fiji	Filariasis Tuberculosis Leprosy	Respiratory infections Gastrointestinal diseases Skin infections Diabetes Hypertension

Region and country	Major health problems around 1955	Major health problems around 1975
Oceania (continued)		
Papua New Guinea	Malaria Tuberculosis Dysentery	Acute respiratory diseases Malaria Gastrointestinal diseases Malnutrition Tuberculosis
South-West Asia		
Saudi Arabia	Malaria Tuberculosis Venereal diseases Schistosomiasis Ankylostomiasis	Tuberculosis Ophthalmia Malaria Schistosomiasis
North Africa		
Morocco	Tuberculosis Eye diseases Venereal diseases Occupational diseases Drug addiction	Malaria Tuberculosis Eye diseases

Source: World Health Organization. World Health Situation Reports.

Cigarette smoking has also been implicated as a major risk factor for chronic bronchitis and emphysema. Alcohol abuse is another underlying cause of premature death, in part because it contributes to the increase in death rates from cirrhosis of the liver and certain nutritional deficiencies, but more importantly through its association with road traffic accidents. Indeed, up to 50 per cent of fatalities from motor vehicle accidents in some countries are believed to be the result of alcohol abuse, with the proportion rising to as high as 80 per cent for males aged 15 to 24 years in some countries. 7/

Development and health policies

Despite the successful control of many infectious diseases through public health measures and the expansion of health services, the recorded decline in national mortality levels has not always been accompanied by a reduction of the inequality in survival chances among various subgroups of national populations. On the contrary, the admittedly very limited data available indicate that the gap may in fact have been widening. Because of the inequitable distribution of and access to the benefits of development and health services, the privileged groups - be they privileged in terms of education, socio-economic status and income, caste or political power, or in terms of a combination of all these characteristics - have generally benefitted disproportionately. 8/

An important feature of development efforts in the past quarter century has been the priority assigned to the health sector in the national strategies. Some developing countries, such as Cuba, the People's Republic of China and Sri Lanka, have placed great importance on the improvement of social conditions of their population, in particular with regard to education and health promotion and protection, and on equal access to them. Education and health promotion, two critical aspects of the development of human resources and hence of social and economic development, have been accorded a priority equivalent to that accorded to the expansion of the economy, to increasing productivity and to industrial growth. The emphasis on education and the development of human resources has in turn led to better health. (See details in table 3, annexed to this paper.)

At the other extreme of developmental concepts are countries such as the Republic of Korea and Japan, which, although equally committed to the same ultimate goals, have acted on the assumption that the best strategy for raising standards of living and meeting basic needs was economic growth, the benefits of which would, with some time-lag, "trickle down". In both groups of countries, as well as in other countries whose developmental strategies would place them between the two ideological extremes, there are examples of improvements in health as reflected by steep declines of mortality. The estimates shown in table 2 are those made so far by some countries of Asia and Oceania, indicating their stage of mortality transition. In at least half of the countries shown, the level of life expectancy at birth exceeded 60 years in 1980. Only four countries had achieved this level two decades earlier. It should be noted, however, that in four major countries of the region

Table 2. Life expectancy at birth. Selected countries of Asia and Oceania

Country	Life expectancy at birth 1960-1965	Life expectancy at birth 1980-1985
Afghanistan	34.1	37.0
Australia	71.2	74.3
Bangladesh	43.9	47.6
Burma	45.0	55.0
Fiji	65.7	71.3
Hong Kong	66.1	73.9
India	43.7	52.5
Indonesia	42.5	52.5
Malaysia	55.7	66.9
Nepal	39.1	45.9
New Zealand	71.8	72.9
Pakistan	44.4	50.0
Papua New Guinea	42.7	53.3
Philippines	54.5	64.5
Republic of Korea	55.2	67.5
Sri Lanka	63.5	67.5
Thailand	53.9	62.7

Source: World Population Prospects: Estimates and Projections as Assessed in 1982, forthcoming publication of the Population Division, Department of International Economic and Social Affairs, United Nations Secretariat.

(Afghanistan, Bangladesh, Nepal and Pakistan), which together comprised a population of over 200 million, the expectation of life at birth was estimated to be no higher than 50 years.

The "success stories" of mortality decline in Sri Lanka, the Indian state of Kerala, Cuba and Costa Rica have not yet provided a full explanation of the processes which brought about the rapid mortality transition. There are, however, strong indications that much of the decline in death rates is attributable to a strong political commitment to improving the health and general welfare of the populations, including an emphasis on comparatively simple preventive measures, health education and the delivery of services to the doorstep of households in rural areas. However, whether and to what extent the lessons learned can be transferred to more populous countries, and to countries with different socio-political structures, remains to be seen.

The stagnation of mortality decline

In the late 1960s and during the 1970s, a slowing down of the rate of mortality decline was observed in some less developed countries. In some instances, the deceleration of mortality decline occurred only after substantial progress in reducing death rates had been made. This was to be expected in countries where major gains in reducing mortality had already been achieved. In other countries, however, the deceleration of mortality decline and, in a few instances, even a period of stagnation had taken place at levels which are still sufficiently high to be amenable to further rapid reductions. The reasons for this retardation of mortality decline appear to be associated with slower social and economic development, as well as the inadequacies of public health measures and of health care services. The specific causes undoubtedly vary from country to country as does the relative importance of each of the individual factors mentioned above. It is worth noting, however, that this slowing down of mortality reduction has often occurred in parallel with a general retardation of economic growth. For many developing countries the factors underlying this economic slow-down are often beyond their control - to name but a few: increasing cost of imported energy, a crushing debt burden, impact of world-wide inflation and unemployment, decreasing flow of foreign aid, and rising barriers to international trade in manufactured goods and commodities. Increasing population size will give an additional dimension to the already pressing need to provide adequate services - health care and education, in particular - to improve housing, environmental sanitation and transportation and to generate job opportunities. This all serves to underline the urgent need to control population growth through every appropriate means, including more widespread and efficient family planning services. At least two studies of mortality trends in Latin America have attributed the stagnation of mortality decline to a deterioration in living conditions among major sections of the population. 9/ Furthermore, reports and studies on the health situation in other developing countries suggest that most of the major health concerns of the 1950s still represent the major health challenges of the 1970s (see table 1).

It is clearly an important and urgent matter to identify and document the underlying causes of this retardation in progress towards reducing preventable mortality. In this context, the rate of economic development and the equity of this development have attracted considerable interest, without any clear consensus having emerged. The last decades do not seem to show any examples of substantial progress in the health status of a population in the absence of economic growth. The Indian state of Kerala and Sri Lanka have been cited as cases where the principal factor underlying mortality declines and general gains in health has been social development - as reflected by improved education and literacy and increased political participation. However, this development occurred in conditions of relatively equitable distributions of land and income and during periods of higher economic productivity. In addition, a better distribution of health care outlets in rural Kerala and a high level of accessibility to and utilization of health services have undoubtedly contributed to the improvement in mortality, as well as to the comparatively high acceptance of family planning services.

The choice between development policies focused on economic growth and policies giving priority to social equity is not, of course, an either/or choice. Rather, the issue is whether a policy which accords priority to social equity is likely to be more effective in inducing economic growth. The premise which underlies the social equity approach stresses the importance of utilizing the creative talents and political involvement of the population at large, political reforms and a redistribution of wealth, including the benefits of economic growth itself. In South and East Asia, at least, it would appear that where policies of social equality have been pursued their impact on the health sector has been more efficient or, at worst, not less efficient than that of the alternatives.

During the 1970s increasing expectations for better health care and widespread frustrations among the underserved, especially the rural poor, led to critical reappraisals of the entire health care systems in many developing countries. These reappraisals brought into question the underlying concepts and strategies of existing health systems, generally imported unquestioningly along with sophisticated health technology, and often with an elitist approach to the organization of the health care delivery system and neglect of the needs of the vast majority of the poor. The general contention that Western health care models are inapplicable to most developing countries has come to be widely accepted.

The concern for an adequate health strategy to better meet the needs of the majority of the world's population culminated in the Declaration of Alma Ata in 1978, 10/ which stated that primary health care was the key to attaining health for all. At Alma Ata and in recent World Health Assemblies the nations of the world have committed themselves to attaining an acceptable level of health for all by the year 2000, so that all of their respective populations can live socially and economically productive lives. The principles and approaches of primary health care have been endorsed as providing the key for achieving this goal. Underlying primary health care is the conviction that health and development are closely related.

At the Alma Ata Conference, primary health care was defined as "essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination. It forms an integral part of the country's health system, of which it is the central function and main focus, and of the overall social and economic development of the community. It is the first level of contact of individuals, the family and community with the national health system bringing health care as close as possible to where people live and work, and constitutes the first element of a continuing health process". 11/

The Declaration of Alma Ata also defined the essential elements of primary health care as "education concerning prevailing health problems and the methods of preventing and controlling them; promotion of food supply and proper nutrition; an adequate supply of safe water and basic sanitation; maternal and child health care, including family planning; immunization against the major infectious diseases; prevention and control of locally endemic diseases; appropriate treatment of common diseases and injuries; and provision of essential drugs". 12/

In November 1979 the United Nations General Assembly adopted resolution 34/58 concerning health as an integral part of development. In this resolution, the General Assembly endorsed the Declaration of Alma Ata, welcomed the efforts of World Health Organization and the United Nations Children's Fund (UNICEF) to attain health for all by the year 2000, and called upon the relevant bodies of the United Nations system to co-ordinate with and support the efforts of WHO by appropriate actions within their respective spheres of competence. In connection with the preparation of a new international development strategy, which was considered during the special session of the United Nations General Assembly in 1980, the General Assembly called for careful attention to be given to WHO's contribution, which reflects the Global Strategy for Health for All by the Year 2000. 13/.

The Global Strategy which was based on national and regional strategies and was adopted by the Thirty-fourth World Health Assembly in 1981 (resolution WHA34.36), indicates the broad lines of action to be taken in the health sector and in related social and economic sectors, nationally and internationally, with respect to all the essential issues mentioned in the relevant document of the WHO Executive Board. 14/ In so doing, the strategy makes full use of the Declaration of Alma Ata and indicates ways by which countries can develop their health systems on the basis of primary health care as described in the report of the Alma Ata Conference, as well as ways by which international action can support these national endeavours. The strategy also responds to resolution 34/58 of the United Nations General Assembly by specifying joint activities in the health and related social and economic sectors that reinforce each other and contribute to human development in general and health development in particular. The same year, the United Nations General Assembly adopted resolution 36/43 which "endorses the Global Strategy for Health for All by the Year 2000 as a major contribution of Member States to the attainment of the world-wide social goal of health for all by the year 2000 and to the fulfilment of the International Development Strategy for the Third United Nations Development Decade." 15/ It also "requests all appropriate organizations and bodies of the United Nations system - including the United Nations Children's Fund, the Food and Agriculture Organization of the United Nations, the International Labour Organisation, the United Nations Development Programme, the United Nations Environment Programme, the United Nations Educational, Scientific and Cultural Organization, the United Nations Fund for Population Activities and the World Bank - to collaborate fully with the World Health Organization in carrying out the Global Strategy."

The case of developing countries

Perhaps the major thrust of the primary health care approach, however, is to better meet the health needs of vulnerable groups of the population, especially at the village level, and in this respect the significance of maternal and child health vis-à-vis the strategy cannot be over-emphasized. The basic principles underlying the concept of primary health care are fundamental to maternal and child health care. In particular, the emphasis of community involvement must be on the issues of how women's involvement in health care can be made more equitable and more effective, how women's organizations, including village groups, can be mobilized to promote primary health care, and what type of societal, community and family action is necessary to ensure support for women as mothers along with their other roles. Given the significance of the family in the implementation of maternal and child health activities, the emphasis of maternal and child health care within primary health care lies in supporting community and family self-reliance, especially with regard to the family's responsibilities in childbearing, child-rearing and self-care. Furthermore, primary health care is intended to make maximum use of local resources, which in the case of maternal and child health care means utilizing traditional birth attendants, village health workers and other personnel with appropriate and realistic training. Other facets of primary health care include supporting families in their self-care role. An example of this is training the women in the use of oral rehydration packets for treatment of diarrhoeal disease or in the preparation of such solutions from locally available ingredients. 16/ For primary health care to work effectively, it is also essential that it be adequately supported by the health care infrastructure, especially with regard to transport, facilities and supervision in cases where referral for more specialized care is required.

With the increasing concern in recent years for better integration of health-related policies into overall development plans, greater emphasis is now being given in many countries to the primary health care approach. Bangladesh, for example, has been building up a health care infrastructure in the rural counties (thanas) and is training traditional healers (Palli Chikitshaks) as an auxiliary cadre to augment the peripheral health personnel. In India there has been a very large input into the primary health programme. 17/ In addition to extending its network of primary health centres and sub-centres - with the latter eventually serving a population of 5,000, instead of the current 10,000 - India is also retraining what were formerly unipurpose workers to become multipurpose workers under the primary health care system. In most states (but not in Kerala and Tamil Nadu), community health volunteers are being trained with the aim of having one in every village by 1985 (by the end of 1980, 156,000 had been trained). There are similar plans to provide basic health care down to the village level, through training village volunteers and traditional birth attendants, in Indonesia, Nepal, Thailand and the Philippines, among others. 18/

Preliminary evidence regarding the implementation of primary health care would suggest that a conducive socio-political environment is not necessarily a pre-condition for progress with this approach. To begin with, the goal of health for all by the year 2000 forces the health sector to adopt a prospective view of health development and not merely to react to what has happened in the past. There is also evidence that some Governments have changed their patterns of spending on health care, with very dramatic shifts in some cases. 19/ In addition, primary health care is encouraging greater local self-reliance in some developing countries, with the use of local taxes and local resources. More and more people have been brought within reach of either ambulatory clinics or village health workers. This is not to suggest that the implementation of primary health care will not encounter obstacles, especially where a highly centralized government policy with regard to such matters as regional autonomy, public finance, rural development and local government is in force. However, the encouraging developments, not only in commitment but also in infrastructure, provide grounds for optimism.

The case of developed countries

The primary health care approach is equally applicable in the developed countries although, given the level of health and health infrastructure development, the orientation is somewhat different. In this case the emphasis will be more on a reappraisal of institutional care, on new approaches to prevention and the promotion of healthy life-styles, on the expanding role of health education, and on better co-ordination between health services and the other sectors bearing on health. The factors underlying the need for a new approach are in part economic - the rising costs of health care - and in part a reflection of the concern which surrounds the widespread failure of adult males in particular to achieve further substantial mortality reductions.

Health care policies in the developed countries will also need to take increasingly into account the changes in the age structure of death: an increasing proportion of deaths is now occurring among the elderly, and especially among the very old. At the other end of the life-span, improved obstetrical procedures and better pre- and post-natal care have brought about a shift in the age distribution of deaths in many developed countries, with a greater proportion of infant deaths occurring in the period immediately following birth. The implications of these changes are considerable. The lengthening of life may not always be accompanied by a corresponding postponement of morbidity which would permit the elderly to enjoy more years of healthy life. The increased burden of ill health arising from the aged population may well require that long-term health care programmes be deinstitutionalized and provide for more independent alternative living arrangements for the individual. Simultaneously, home health care services will need to be better developed, requiring, in many instances, a more supportive role by the family in the care of the aged. Also, the substantial progress in reducing infant and late foetal mortality has increased the need for sophisticated post-natal equipment to sustain those infants who would previously have succumbed to congenital infirmities or birth injuries.

Sex differentials in mortality have also widened considerably in the developed countries over the course of the twentieth century and especially since the Second World War. Much of this trend has arisen from differential mortality changes for the sexes at ages 45 years and over, although excess male mortality from traffic accidents at ages 15 to 24 years has contributed significantly to the trend in a number of countries, most notably Australia, Austria and the United States. Among adults, increasing male excess mortality from coronary heart disease, lung cancer, chronic bronchitis and emphysema has been largely responsible for this development, although it is interesting to note that the sex ratio of mortality from lung cancer is now actually declining in countries such as Australia, the United Kingdom, the United States, Sweden and Denmark, where female mortality from the disease is now rising faster than that of males. Mortality from coronary heart disease has also declined by up to 25 per cent in some countries since the late 1960s, although the factors underlying this change, principally the role of behaviour modification versus that of more efficacious health care facilities for the management of coronary patients, are still very much a matter of debate. 20/

Certainly, the resolution of this debate and the broader question of the relative merits of preventive and curative health care will be critical for guiding health policy in the developed countries in the next decades. However, the remarks made by Greenwood 21/ many years ago concerning the scientific prudence of waiting for nosological data until they are statistically exact could equally well apply today in the context of the underlying causes of the leading chronic diseases. Epidemiological investigation has repeatedly found that various behavioural traits, principal among them being cigarette smoking, are associated with higher levels of morbidity and mortality from such causes as coronary heart disease, lung cancer and the chronic respiratory diseases. Irrespective of the contribution of improved medical and surgical procedures in dealing with cases of these diseases, the preventive role of health education programmes in encouraging behaviour modification to reduce the likelihood of succumbing to these diseases cannot be emphasized enough and must form the cornerstone of national health policy designed to cope with them. In this respect a much more effective means for integrating into the formulation of health policy the findings of behavioural science research on the reasons underlying the adoption of detrimental health habits is needed. These factors are undoubtedly complex and interactive, encompassing such facets as emotional need, response to emotional disturbance, role definition, stress alleviation and feelings of individual autonomy arising from task demand at the work place. Health education programmes must aim at providing alternatives for these responses which do not lead to health-impairing practices. The failure of such programmes to prevent cigarette smoking on a massive scale among adolescent females in recent years attests to the urgency of their revision.

At the same time, it has become clear that the demand for health care has no immediate limit and that the cost of such care will continue to rise. Moreover, there is an increasing literature which suggests that expenditure on health services in the developed countries is not always rewarded with proportionately favourable changes in health. The medical establishment and especially medical schools are coming under increasing criticism for the concentration of clinical science and practice on the mechanism of disease and the technology for dealing with it rather than on the process of disease causation. There is, therefore, an urgent need to ensure that those agencies responsible for primary and community care are, as emphasized at the Alma Ata Conference, given sufficient opportunity to penetrate effectively the traditions which have flourished in medical schools and teaching hospitals. The integration of family planning into the curricula of medical schools is one of the elements which is required. There is also a need to encourage more emphasis on prevention in the training of physicians. Given the nature of the disease and injury burden in low-mortality countries, the inevitable limitations of technological progress in the medical field to cope with it have to be recognized and a greater commitment must be made to prevention and caring. It is in this sense that health for all in these countries does not primarily constitute a technical or even economic challenge - but, rather, one for social development, social equity and the political will to implement such goals.

Greater responsibility of the individual for his own health protection and for self-care is - at the individual and family level - the other important ingredient of the primary health care approach. Underlying this is the principle of demedicalization of health care. These elements are, undoubtedly, more difficult to implement through the traditional bureaucratic and institutional channels. There is great scope for the involvement of the voluntary and other non-governmental organizations in this type of work, as has been demonstrated earlier in the case of family planning activities.

Conclusion

According to recent United Nations estimates, population structure and distribution in the majority of less developed countries in the period up to the year 2000 will be characterized by continuing youthfulness and growing urbanization. These trends have important implications for the organization and orientation of health services in the next 20 years. Child and maternal health care will remain - along with family planning services - an important part of the activities. The currently underserved rural populations will continue to be in need of preventive and curative services, in particular in the countries of Africa and Southern Asia, where the largest gap between rural and urban access to such services prevails. The national health programmes must also recognize the existence of wide differences in health among various social groups in both rural and urban areas. At the root of these differences are problems of social inequality, reflected in poverty, illiteracy, malnutrition and lack of job opportunities, that are, by their very nature, not amenable to the type of intervention which the health sector can provide. The problems confronting countries where mortality is still relatively high in their endeavour to provide adequate health services and facilities for all, in the foreseeable future, call for the creation of social, economic, cultural and politico-institutional pre-conditions to overcome the contradiction between what is technologically possible and the social and economic ability to apply it to all in need. The new strategy in the health sector advocated in the Alma Ata Declaration can be fully effective only if it becomes an integral component of an overall development strategy that is committed to social equity.

It is shown as an example in table 2 that in at least seven major countries of Southern Asia, and in Papua New Guinea, the life expectancy at birth had not reached 60 years by 1980. It is in these countries that the major health problems, associated with the high incidence and prevalence of infectious and parasitic disease and malnutrition, are also concentrated. It is not a pure coincidence that in all of them high fertility contributes to the other health problems. Their rapid population growth, among other things, has made qualitative improvements in the development of human resources, including health, only a slow process. To achieve by the year 2000 a rapid change in and radical improvement of mortality may be, at least in some of them, a nearly impossible task. For those countries where the level of mortality is equivalent to a life expectancy at birth in excess of 60 years, an incipient "modernization" of the cause-of-death pattern can be observed. The management of "modern" diseases such as neoplasms and cardiovascular diseases has in fact already emerged as one of the major health concerns in China and Sri Lanka; it is certain that during the next two decades similar trends will appear in the other countries of Southern Asia as well as in countries of Africa and Latin America as they advance on the road to lower mortality.

Hence, countries which are currently developing health care systems better suited to serving the needs of their rural and urban populations within the context of health problems dominated by infectious and parasitic diseases, by inadequate sanitation and by malnutrition will also need to take a long-term perspective. Once full primary health care coverage has been achieved, an adaptation of the health care system will be required to meet the growing needs in the future for curative and, especially, preventive measures against such illnesses as cardio-vascular diseases and neoplasms, which will gradually move to the forefront of health concerns. There is evidence that in recent years the Chinese 22/ have been attempting to develop a system of more sophisticated medical care requiring a complex array of facilities, personnel and equipment without, however, abandoning the health-worker system that has functioned so remarkably well to date. The constant upgrading, through formal and on-the-job training, of the qualifications of these health workers ("barefoot doctors") is a part of the strategy aimed at coping with the new emerging health problems. The crucial point is that the health administrators and planners in the less developed countries need to plan not only for their immediate needs, but also for the future.

The pace of future declines in mortality in the less developed countries of Asia and other regions of the world will depend not only on the development and application of new strategies in national health policy, but also on the extent to which other, largely social and economic, problems which individual countries face today will be alleviated. It has been recognized, among other instances also in the Alma Ata Declaration, that direct medical intervention, both curative and preventive, has only a limited potential to improve health and reduce mortality. The control of morbidity and mortality from a broad array of causes will also depend on relatively expensive programmes of environmental sanitation - water supply and sewage in particular. But much more important for the level of health of the people will be the maintenance of adequate nutrition and access to the basic necessities of life, regardless of any possible economic crisis.

At the individual and household level, living standards and education have played, and continue to play, an important role. Differentials in levels of mortality and morbidity that persist among various population groups in a country, for example between the urban and the rural populations, and among social groups are associated not only with the variations in the availability of, and access to, health services but also with variations in social status, education, literacy, income and housing conditions. Even in countries where urban dwellers enjoy better access to health facilities, considerable differences in mortality exist between the low-income, illiterate, inadequately housed majority and the wealthier families. The long-term impact on morbidity and mortality of develoment programmes which aim at reducing existing inequalities in opportunities for education and employment and at alleviating poverty may well prove to be more important than a direct intervention against some of the health problems through expansion of health services alone.

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Annex

Table 3. Average life expectancy at birth, 1980-1985, and Governments' perceptions of its acceptability in prevailing economic and social circumstances, by areas of responsibility of regional commissions, geographical regions and level of development, 1983

Under 50 years		50-61 years		62[a]-69 years		70 years and over		All ages		Total
Acceptable	Not Acceptable	Acceptable	Not Acceptable	Acceptable	Not Acceptable	Acceptable	Not Acceptable	Acceptable	Not Acceptable	
A. Area of responsibility of Economic Commission for Africa										
Eastern Africa										
Rwanda	Burundi Comoros Djibouti Ethiopia Madagascar Malawi Mozambique Somalia	-	Kenya Uganda United Republic of Tanzania Zambia Zimbabwe	Seychelles	Mauritius	-	-	2	14	16
Middle Africa										
-	Angola Central African Republic Chad Congo Equatorial Guinea Gabon Sao Tome and Principe United Republic of Cameroon Zaire	-	-	-	-	-	-	-	9	9
Northern Africa										
-	Sudan	Libyan Arab Jamahiriya	Algeria Egypt Morocco Tunisia	-	-	-	-	1	5	6
Southern Africa										
-	Swaziland	-	Botswana Lesotho	-	South Africa	-	-	-	4	4

Under 50 years		50-61 years		62[a]-69 years		70 years and over		All ages		Total
Acceptable	Not Acceptable	Acceptable	Not Acceptable	Acceptable	Not Acceptable	Acceptable	Not Acceptable	Acceptable	Not Acceptable	
A. Area of responsibility of Economic Commission for Africa (continued)										
Western Africa										
Ivory Coast	Benin Ghana Guinea Guinea-Bissau Mali Mauritania Niger Sengal Sierra Leone Togo Upper Volta	-	Gambia Liberia Nigeria	-	Cape Verde	-	-	1	15	16
TOTAL: 2	30	1	14	1	3	-	-	4	47	51
B. Area of responsibility of Economic Commission for Europe										
Eastern Europe										
-	-	-	-	-	-	Bulgaria Czechoslovakia German Democratic Republic Hungary Romania	Poland	5	1	6
Northern Europe										
-	-	-	-	-	-	Denmark Finland Iceland Ireland Norway Sweden	United Kingdom	6	1	7

Under 50 years		50-61 years		62[a/]-69 years		70 years and over		All ages		Total
Acceptable	Not Acceptable	Acceptable	Not Acceptable	Acceptable	Not Acceptable	Acceptable	Not Acceptable	Acceptable	Not Acceptable	
B. Area of responsibility of Economic Commission for Europe (continued)										
Southern Europe										
-	-	-	-	-	-	Holy See Malta Portugal San Marino Spain	Albania Greece Italy Yugoslavia	5	4	9
Western Europe										
-	-	-	-	-	-	Austria Belgium France Germany, Federal Republic of Liechtenstein Luxembourg Monaco Netherlands Switzerland	-	9		9
Western South Asia (part)										
-	-	-	-	-	Turkey	Cyprus Israel	-	2	1	3
Northern America										
-	-	-	-	-	-	Canada United States of America	-	2		2
Union of Soviet Socialist Republics										
-	-	-	-	-	-	Ukrainian SSR Union of Soviet Socialist Republics	Byelorussian SSR	2	1	3
TOTAL:										
-	-	-	-	-	1	31	7	31	8	39

Under 50 years		50-61 years		62[a]-69 years		70 years and over		All ages		Total
Acceptable	Not Acceptable	Acceptable	Not Acceptable	Acceptable	Not Acceptable	Acceptable	Not Acceptable	Acceptable	Not Acceptable	
C. Area of responsibility of Economic Commission for Latin America										
Caribbean										
-	-	-	Haiti	-	Antigua and Barbuda Bahamas Dominica Dominican Republic Grenada Saint Lucia Saint Vincent and the Grenadines	Barbados Cuba Trinidad and Tobago	Jamaica	3	9	12
Central America										
-	-	-	Guatemala Honduras Nicaragua	Belize Mexico	El Salvador	Costa Rica Panama	-	4	4	8
Temperate South America										
-	-	-	-	Argentina Chile	-	Uruguay	-	3	-	3
Tropical South America										
-	-	-	Bolivia Peru	Paraguay	Brazil Colombia Ecuador Suriname Venezuela	Guyana	-	2	7	9
TOTAL:										
-	-	-	6	5	13	7	1	12	20	32

Under 50 years		50-61 years		62[a]-69 years		70 years and over		All ages		Total
Acceptable	Not Acceptable	Acceptable	Not Acceptable	Acceptable	Not Acceptable	Acceptable	Not Acceptable	Acceptable	Not Acceptable	
D. Area of responsibility of Economic Commission for Western Asia										
Western South Asia[b]										
Yemen	Democratic Yemen Oman	Iraq Qatar	Saudi Arabia	Bahrain Syrian Arab Republic United Arab Emirates	Jordan Lebanon	Kuwait	-	7	5	12
TOTAL: 1	2	2	1	3	2	1	-	7	5	12
E. Area of responsibility of Economic and Social Commission for Asia and the Pacific										
China										
-	-	-	-	-	China	-	-	-	1	1
Japan										
-	-	-	-	-	-	Japan	-	1	-	1
Other East Asia										
-	-	-	-	-	Democratic People's Republic of Korea Mongolia Republic of Korea	-	-	-	3	3
South-Eastern Asia										
-	Democratic Kampuchea	Lao People's Democratic Republic	Burma Indonesia Viet Nam	Malaysia Philippines Thailand	-	Singapore	-	4	5	9
Southern Asia										
-	Afghanistan Bangladesh Bhutan Maldives Nepal	-	India Iran Pakistan	-	Sri Lanka	-	-	-	9	9

Under 50 years		50-61 years		62[a/]-69 years		70 years and over		All ages		Total
Acceptable	Not Acceptable	Acceptable	Not Acceptable	Acceptable	Not Acceptable	Acceptable	Not Acceptable	Acceptable	Not Acceptable	
E. Area of responsibility of Economic and Social Commission for Asia and the Pacific (continued)										
Australia-New Zealand										
-	-	-	-	-	-	Australia New Zealand	-	2	-	2
Melanesia										
-	-	-	New Caledonia Papua New Guinea Solomon Islands	-	-	Fiji	-	1	3	4
Micronesia-Polynesia										
-	-	-	-	-	Kiribati Tonga Samoa Tuvalu	Nauru	-	1	4	5
TOTAL:										
-	7	-	9	3	9	6	-	9	25	34
Developed countries										
-	-	-	-	-	-	32	7	32	7	39
Developing countries										
3	39	3	30	12	28	13	1	31	98	129
TOTAL:										
3	39	3	30	12	28	45	8	63	105	168

Sources: Compiled from replies to "Fifth Population Inquiry Among Governments: monitoring of Government perceptions and policies on demographic trends and levels in relation to development as of 1982"; and from the Population Policy Data Bank of the Department of International Economic and Social Affairs of the United Nations Secretariat; Demographic Indicators of Countries, Estimates and Projections as assessed in 1980 (United Nations publication, Sales No. E.82.XIII.5).

a/ A life expectancy at birth of 62 years corresponds to the average world life expectancy by 1985 referred to in paragraph 22 of the World Population Plan of Action. The other categories in this table were chosen with reference to this figure.

b/ Excluding Cyprus, Israel and Turkey.

II. MORTALITY TRENDS AND DETERMINANTS

A. Introductory remarks on interactions between health mortality and development

John C. Caldwell*

These remarks will make no attempt to cover the field; rather, it will attempt to identify some of the outstanding problems.

Inevitably, the first difficulties relate to definition, although they are more marked in the area with which we are concerned here than in most other areas.

Demographers, social historians and those persons constructing social indices sometimes give the impression of being obsessed with mortality instead of with the problems of the living: morbidity or sickness and health. Mortality, because of its finality and because it often should have been avoided, deserves attention. Yet much of the attention given to mortality is really an attempt to find a condition which is indisputably identifiable and can be easily measured. In most third-world countries, mortality is still not as easily measured as births, and measurements are often vitiated by inadequate age data.

Several points should be made. First, health is not the opposite or complement of mortality. Secondly, although we have concepts of health, we have practically nothing that is unquestionably identifiable, let alone measurable. Morbidity, or at least specific illness, can usually be identified by highly trained persons, although often only by means of extensive tests with expensive and scarce equipment. There are hardly any usable morbidity survey results available for the developing world. Epidemiological surveys are usually confined to a single, relatively easily identifiable disease. Self-diagnosis or the collection of symptoms by non-medically-trained persons is occasionally attempted in industrialized countries but is in most developing countries worthless either because of low levels of education among the respondents or because of substantial differences between survey organizers and respondents with regard to concepts about health and disease. In rural south India, we find that many sick respondents deny their sickness to us because they hold that their condition is a case of earthly or theological imbalance. Analyses based upon hospital records can be extremely misleading because of selectivity for both persons and diseases.

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The Alma Ata Declaration 1/ rightly placed emphasis on the need to respect different cultures and their cosmologies. Yet this aspect of the Declaration places us in something of a bind if we are seeking the shortest and most certain path to good health for all by the year 2000. Most traditional explanations of sickness and corresponding treatments are embedded in essentially religious beliefs about the nature of human beings and the reasons for their ills. Secular social scientists often avoid facing this fact by merely referring to cultural differences - almost as if fashions or habits were being described. But the only evidence we possess with regard to the route to really low mortality levels is that they have been achieved so far in only one way - that is, by dint of massive rises in living standards associated with the industrial revolution, and with certain types of social change (such as mass education) made possible by these rises in living standards, and through the use of modern medicine which developed as part of the same technological and scientific revolution. No other alternative system for explaining ill health and treating sickness has produced massive change, although certain specific treatments or herbal drugs may be effective, while some modern medicine may be harmful. Yet differences in mortality levels between different traditional societies in the past appear to be explained less by their theories of disease and the approaches of their medical practitioners than by differentials in the levels of violence, standards of living, food consumption, the epidemiological ecology of the area and habits of hygiene, and, perhaps most importantly, by density of population (and whether critical minimum masses had been achieved for the transmission of various types of disease).

We shall now turn to the relationship between development and mortality decline.

As foreshadowed, once we reach specific questions of this type we forget all about trying to relate evidence about develoment to evidence about health, and choose instead mortality. Nevertheless, complexities remain. Development and change are not entirely economic. That which most affects us may well be social, even if the limits of social change are economically determined. These are no mere quibbles - certainly not in the field of health - for there is accumulating evidence that there may be different social paths to very different mortality levels at the same economic level.

Preston's 1975 paper 2/ demonstrated a high correlation between infant mortality and per capita income. Nevertheless, it showed that the curve linking life expectancy to per capita income has shifted upward during the present century, and it concluded that 75 to 90 per cent of the gain in expectation of life at birth between the 1930s and the 1960s was exogenous to gain in income. The paper suggested that the gap was probably explained by changes in medical technology and the extent of its application. Since then, evidence has accumulated that social change may explain a considerable part of the gap, some of it related to the acceptance of medical technology but much of it to other behavioural change with health implications. Indeed, one must explain just how economic development and the availability of medical technology are transmuted into better health; furthermore when, later, we identify education as a major element in social change, we shall have to try to explain also how it achieves its impact. Preston made another point which is important to the deliberations of this meeting. He empirically tested the basic Malthusian proposition that no benefits arose from reducing a specific pressure on health because any gains against mortality accelerated population growth, thus raising mortality again because of the renewed pressure on resources. He showed that appreciable gains, all other things being equal (which they probably are not), are retained for decades and even centuries.

What are the social changes that might be important? We began work in rural south India 3/ convinced that the limitation on the impact of modern health services lay in limited supply rather than demand. On the contrary, we found a deficient, although increasing, demand. The reason was that a large part of the population believed that for many diseases neither the explanations nor the treatments of the health centre were appropriate. Furthermore, their inappropriateness varied according to the age and sex of the sick person. The rising demand is explained by the evolution of an increasingly secular society, where the process is marked less by the loss of religion than by the successive transfer of different types of disorder from the religious to the material domain. Even a half-hearted belief in the curative powers of modern medicine is often indicative of a half-hearted belief in some alternative explanation. Much more research is needed into such matters.

The greatest mechanism for social change is education. Its impact does not lie wholly in its being a vehicle for a stronger belief in modern medicine. Indeed, we first became interested in the influence of maternal education over child survival when we found in an area of Nigeria where modern medicine was inaccessible that child survival rose steeply with the schooling of mothers. 4/ This can also be shown in all World Fertility Survey data. 5/ In some, the education of fathers has an almost competitive impact, but the usual picture is for the main influence to be the education of the mother and the occupation or income of the father.

How does education work? Both West African and south Indian evidence suggests that the teaching of health measures in school is only a minor factor. The key factor seems to be that a woman who goes to school is increasingly seen by both herself and others as being part of a global society with an accepted attitude towards bacterial contamination and corresponding hygienic methods, the use of modern medical facilities and persistence in recommended treatments. In south India, mothers are in the great majority of cases the first to perceive child-sickness. With every year of education they are more likely to draw attention to it without waiting for their mothers-in-law or husbands to notice; they are more likely to demand that something should be done about it; they are more likely to prefer the health centre and are more likely to be allowed to use it; and they are more likely to persist in the recommended treatment. This is not the whole story. In Nigeria they are more likely to be able to insist successfully that the health facilities should provide them with adequate treatment. 6/ Educated mothers distribute food within the family in closer accord with needs, and they are less likely to insist that a sick child should get up and work. In terms of the conditions of food and water as well as personal cleanliness and contact with infection, they are more likely to behave in accordance with beliefs in bacterial rather than religious pollution. It should be noted that there is clear evidence in the case of the Indian state of Kerala that education has been one ingredient in the grass-roots politicization which has resulted not only in a greater demand upon government for health facilities but in strong local pressure that these facilites should provide all services as efficiently as possible. There are other complexities. For instance, educated parents are more likely to have children who go to school. Not only is it probable that schoolchildren look after themselves better, but they are more articulate and make greater demands for care and consumption; in addition, the schools intervene in identifying sickness and demanding care and treatment.

Education is only one aspect of a much broader change in families as the economy is transformed from being largely agrarian to one in which non-agricultural occupations are also important. The concept of child immaturity and dependency, with the resulting need for care, affects even families that do not send their children to school. The situation described in the Bengal famine of 1943-1944, where the feeding priority was largely for mature adults, 7/ is changing. Where we are researching in south India, the feeling is increasing that scarce income should be used to buy food from the market during hungry periods rather than accepting these periods as natural and inevitable.

Development can clearly lead for some time to a deterioration of health and to higher mortality. This was the case when settlers intent upon practising commercial agriculture took over the lands of the indigenous population in North America and Australia. In Africa, death rates rose steeply during the rape of the Congo Free State and much higher mortality was frequently associated elsewhere with the movement of populations for construction work, partly because men came in contact with diseases against which they had little immunity and partly because they left the family situation, where at least a minimum level of hygiene was maintained and wives provided more satisfactory food. It is more contentious whether contemporary urbanization has, on balance, a harmful effect. Squatter communities often lack hygienic facilities, but the concentration of population may well make it easier for Governments to meet basic needs. 8/

With regard to many interrelations we are still in the dark. To what extent was the Sahelian drought compounded by development and population increase or, ultimately, is this the only route towards building a more drought-resistant economy? It is clear that the Sahelian drought was not Malthusian in its impact and that the slight and temporary reduction in population growth owed more to marriage deferment than to mortality.

It seems probable that social change can reduce mortality only to a certain point unless incomes rise substantially. Yet the examples of Kerala and Sri Lanka, with expectations of life at birth around 65 years, resulting largely from educational and health services, lead one to wonder. This is also the case in Cuba and China, where governmental and political intervention has largely forced the adoption of "modern" explanations of ill health and its treatment. If gains against mortality are slowing down (and the papers of neither the Economic Commission for Africa (ECA) nor the Centro Lationamericano de Demografía (CELADE) are convincing on this point), the culprit may just as well be slow social as slow economic change.

It is clear that countries undergoing development frequently exhibit substantial socio-economic and other differentials in mortality, although it should be noted that most of our evidence is for children and the adult situation may be different. In remote rural areas of both Nigeria and India, we have found only minor differentials in child mortality by parents' economic situation but major differentials by parental education. It is possible that economic development and social change - perhaps the latter more than the former - can alter the age structure of mortality and that in parts of West Africa toddler mortality is already declining relative to infant mortality. 9/

Declining mortality can clearly have demographic and developmental effects. Its chief demographic impact is on the rate of population growth, while the effect on age structure is minimal. Probably the most important impact is on health and the capacity for sustained physical work, but this is extremely difficult to measure adequately.

If better health and reduced mortality are among the major ends of development, it is difficult to avoid the conclusion that policies of economic development which economize on social investments are not likely to find the optimum path.

Notes and references

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B. The influence of development-related changes on infant and childhood mortality in Africa

Secretariat of the United Nations Economic Commission for Africa*

INTRODUCTION

In recent years empirical evidence suggesting a deceleration in mortality decline in developing regions of the world has stimulated greater research interest in mortality trends and differentials in these regions. Several studies have suggested that countries in the developing regions of the world experienced significant declines in mortality but that there is currently increasing concern about the deceleration of the trend and momentum of mortality decline in most countries of Africa, Asia and Latin America. This concern is based on the fact that, although the momentum of mortality decline is expected to decrease as mortality levels become relatively very low and average life span exceeds 65 years, available evidence from these regions suggests that the process of deceleration has set in before mortality could be described as low. 1/

A review of the data from the three regions - Africa, Asia and Latin America - suggests that mortality in Africa is the highest for any major region of the world. 2/ Estimates of mortality rates for the region suggest that crude death rates for most countries exceed 15 per thousand and that infant mortality rates range from 100 to 200 per thousand births. Consequently, estimates of life expectancy at birth currently exceed 55 years for countries in the Northern African sub-region only.

It has also been observed in several studies in the region that the most striking feature of mortality in Africa is the dominance of deaths of children under five and the high incidence of deaths of children in the second and third years of life. 3/ In the first part of this paper an attempt is made to assess the level of infant and childhood mortality in African countries and to examine the relative contribution of deaths of children under five to total deaths. In the second part, the paper analyses development-related changes influencing infant and childhood mortality; in that part the role of health programmes, urbanization and education in influencing mortality among children under five years of age is analysed. In the third part, the paper identifies important areas of development policy which are likely to effect significant drops in childhood mortality.

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* Population Division

THE SIGNIFICANCE OF CHILDHOOD MORTALITY IN AFRICA

Mortality during the neonatal period is relatively high in all countries of the world. It is, however, much higher in Africa and remains relatively high throughout the first five years of life. 4/ Thus, as can be observed from the data presented in table 1, post-neonatal mortality is higher than neonatal mortality in Egypt, which has a relatively high rate of infant mortality. When mortality drops significantly, as in the case of Mauritius and Seychelles, the pattern resembles that for low mortality countries (e.g. France), where the neonatal mortality rate is significantly higher than the post-neonatal mortality rate.

Estimated mortality indices from census data for selected African countries presented in table 2 suggest that there has been a drop in crude death rates (CDR) during the intercensal period for all countries under review. The decrease in infant mortality rate in the intercensal periods in these countries has resulted in a corresponding increase in life expectancy at birth. These increases are by no means spectacular and lend credence to the suggestion that there has been a deceleration of mortality decline in the region.

The intercensal increases in life expectancy fall far short of the assumption adopted by the United Nations in 1965, which proposed as a model an annual gain of 0.5 years in expectation of life wherever expectation at birth was less than 55 years. 5/ The data presented in table 2 suggest that current levels of infant mortality are still very high in the African countries. These data also suggest that the expectation of life at birth remains low because of high levels of infant mortality. Farah and Preston have presented data from Sudan showing similarly high mortality for children under two years ($q_2 = 170$) and low expectation of life at birth of 44.85 years which suggest that mortality in that country has not been declining rapidly in past years. 6/

An analysis of the contribution of child deaths to total mortality presented in table 3 suggest that close to half of all deaths occurring each year in the countries listed are deaths to children under five years of age, although their proportion in the total population is much less. This contrasts with the evidence from a low-mortality country such as France, where mortality among persons less than 15 years of age contributes to less than 3 per cent of all deaths. It is worth noting that the low level of infant mortality reported in Mauritius is reflected in the relatively low proportion of total deaths contributed by deaths to children under five years of age. The pattern of mortality in that island is gradually approaching the pattern reported for low-mortality countries of Europe.

A longitudinal study in the Western Region of Ghana also supports the evidence in table 3. During the survey period 1974-1977 deaths to children under five years of age accounted for a very high proportion of total deaths registered in the survey region. These data, which are summarized in table 4 show that close to half of all deaths to males and females were children below five years of age.

Table 1. Infant, neonatal and post-neonatal mortality rates for selected countries

Country	Infant mortality rate	Neonatal mortality rate	Post-neonatal mortality rate
Egypt (1977)	85.3	14.2	71.1
Mauritius (1979)	32.9	20.4	12.5
Seychelles (1979)	26.6	17.9	8.7
Tunisia (1976)	47.2	16.4	30.8
France (1979)	10.0	6.0	4.0

Source: World Health Organization, World health statistics, 1981.

The general picture presented by these data is that deaths to children under five years of age constitute close to half of total deaths, irrespective of method of estimation. This is the case for both males and females, although variations in the proportions may reflect both actual mortality difference between the sexes and differential age errors.

Although cause-of-death data are hard to come by in most African countries, available data from a selected number of countries presented in table 5 suggest that infectious and parasitic diseases are the most common causes of death among children under five years of age. As can be observed from these data, most hospital admissions are for infectious and parasitic diseases. Deaths caused by these diseases constitute about 40 per cent of hospital deaths, except in the case of Mauritius, which has experienced a significant drop in mortality. The percentage of hospital deaths among infants below the age of one year which were caused by infectious and parasitic diseases was very significant even for Mauritius. This percentage is very high for children aged 1 to 4 years in Kenya and Mauritius and it is to be assumed that the pattern will be the same for most African countries. Similarly, diseases of the respiratory system also contribute significantly to deaths among children aged 0 to 4 years. Thus, it will be noted in table 5 that these diseases were reported as causes for 34.7 per cent of total hospital deaths among children under one year of age in Kenya. The corresponding percentage for children one to four years of age was 27.5.

Table 2. Mortality indices for selected African censuses

Indices	Kenya			Malawi			Tanzania			Zambia		
	(ECA) 1969	(ECA) 1979	UN 1980	(ECA) 1966	(ECA) 1971	UN 1975	(ECA) 1967	(ECA) 1978	UN 1980	(ECA) 1969	(ECA) 1974 a/	UN 1975
CDR	17	15	14.4	23	21	21.1	21	17	15.8	21	18	19.1
e_o^o	48	50	53.5	40	43	43.5	43	48	50.5	43	48	45.9
IMR (Sullivan) c/	135	115*	-	154	140	-	152	125	-	141 b/	117	-
q_2^1 (Sullivan) c/	143	.118	-	-	.251	-	.175	.143	-	.152	130	-
Annual growth rate	3.0	3.4	3.9	2.5	3.0	3.0	2.5	3.0	3.05	2.5	3.0	3.05

a/ Based on 1974 sample census of population.

b/ Official government estimate.

c/ These indices were adjusted using the logit system.

* The World Fertility Survey obtained rates ranging from 84 to 90 by applying Brass techniques to child survival data for women 15-19 years of age at the survey data. (See F. L. Mott, "Infant Mortality in Kenya: evidence from the Kenya Fertility Survey," WFS Scientific Reports, No. 32 (August 1982), p. 12).

Table 3. Proportion of child deaths as a proportion of total deaths

Country	Proportion of total deaths			Percentage of population 0-4 years (1980)
	for deaths under 5 years	for deaths 5-14 years	for deaths over 15 years	
Egypt (1977)	.445	.040	.515	15.7
Ghana (1971)	.367	.076	.557	19.5
Kenya (1973)	.558	.074	.368	22.0
Madagascar (1972)	.354	.064	.582	17.7
Malawi (1971-1972)	.640	.104	.256	20.2
Mauritius (1979)	.150	.019	.833	12.8
Tunisia (1973)	.423	.040	.537	15.1
Western Cameroon (1964-1965)	.507	.135	.358	17.1*
France (1977)	.020	.005	.0975	7.1

Sources: World Health Organization, World health statistics, 1981; United Nations Demographic Yearbook, 1979.

* Percentage for the whole of the United Republic of Cameroon.

Although the percentages for Mauritius were relatively lower than those for Kenya, it is significant that the causes of one fifth of all deaths of children aged 1 to 4 years on that island were recorded as diseases of the respiratory system. In all countries considered in this analysis the relative contribution of diseases of the digestive system to childhood mortality was not as important as the contribution of infectious and parasitic diseases and diseases of the respiratory system.

An analysis of morbidity in early childhood in Sierra Leone gives us a clearer picture of the relative contribution of infectious and parasitic diseases and diseases of the respiratory system in the determination of causes of death in children under five years of age. The data presented in table 6 show that acute respiratory infections and malaria constitute the two most important causes of ill health among children under five years of age.

Table 4. Proportion of total deaths by age and sex; Cape Coast Project, Ghana

Age group years	Year of registration 1974-1977 Male	Year of registration 1974-1977 Female	North model estimate Level 14 Male	North model estimate Level 14 Female	Data from compulsory registration areas in Ghana (i) Male	(i) Female	(ii) Male	(ii) Female
0	.207	.250	.318	.292	.232	.252	.177	.206
1-4	.182	.213	.180	.188	.203	.248	.193	.229
0-4	.389	.462	.498	.480	.436	.500	.369	.435
5-14	.062	.061	.092	.097	.064	.071	.075	.078
15+	.548	.477	.411	.423	.501	.429	.566	.487
No.	545	476	-	-	-	-	-	-

Source: S. K. Jain, The Longitudinal Mortality and Fertility Survey in the Western Region of Ghana, Analytical Report (Canberra, The Australian National University, 1981), p. 106.

Diarrhoeal diseases contribute significantly to morbidity during the first two years of life, and when the joint effect of this problem and measles is compounded by malarial attacks their impact on morbidity and mortality during these ages is very substantial. In fact the Sierra Leone study showed that 10.9 per cent of all deaths to infants were caused by diarrhoeal diseases. The corresponding percentage caused by measles was 7.0. 7/

The pattern of mortality in African countries is therefore dominated by mortality among children under five years of age. As demonstrated in the analysis above, infectious and parasitic diseases and diseases of the respiratory system constitute the most dominant causes of death among African children under the age of five years. In the light of these observations, the formulation of policies and programmes will require a greater understanding of those developmental changes in society most likely to affect mortality and morbidity among children during early childhood.

Table 5. Percentage of hospital admissions and deaths due to infectious and parasitic diseases, diseases of the respiratory and digestive systems for selected African countries

Disease group	Percentage of all admissions	Percentage of all hospital deaths	Percentage of children deaths in hospitals under 1 year	1-4 years
Infectious and parasitic diseases				
Kenya (1978)	19.6	34.3	43.8	46.9
Malawi (1980)	27.7	41.4	32.1 (1978)	-
Mauritius (1974)[a]	-	6.3	29.9	35.1
Tanzania (1978)	32.2	43.6	-	-
Zambia (1977)	39.7	40.2	23.6	-
Diseases of the respiratory system				
Kenya (1978)	12.4	20.1	34.7	27.5
Malawi (1980)	10.1	14.2	-	-
Mauritius (1979)[a]	-	10.3	11.9	20.2
Tanzania (1978)	15.5	17.4	-	-
Zambia (1977)	7.7	12.9	14.8	-
Diseases of the digestive system				
Kenya (1978)	3.0	5.0	1.4	1.1
Malawi (1980)	2.0	1.8	-	-
Mauritius (1979)[a]	-	4.6	2.3	3.0
Tanzania (1978)	11.6	11.3	-	-

Sources: Government bulletins and digests of statistics.

[a] Total deaths in the island.

Table 6. Morbidity in children under five years of age: Percentage distribution of diagnosis in Sierra Leone prospective survey 1974-1975

Selected diagnostic groups*	Age in years			
	Under 1	1	2	3-4
Diarrhoeal diseases	10.9	12.1	10.7	7.9
Tetanus	2.2	6.1	-	-
Measles	7.0	6.1	10.7	3.0
Malaria	25.1	18.2	23.0	35.5
Worm infections	6.9	0.7	9.1	13.6
Scabies	2.2	2.3	2.1	1.9
Malnutrition and aneamia	7.2	4.7	7.5	9.0
Acute respiratory infections	26.6	32.0	26.7	22.3
Pneumonias	2.7	3.7	2.1	1.1
Infections of the skin	6.2	5.0	8.0	5.7
Certain perinatal diseases	3.0	9.1	-	-

Source: Ministry of Health of Sierra Leone, and World Health Organization, Infant and Early Childhood Mortality in Relation to Fertility Patterns (Freetown, Sierra Leone, 1980), p. 107, table 8.4.

*Diagnosis classified as other causes excluded.

DEVELOPMENT-RELATED CHANGES INFLUENCING MORTALITY AMONG CHILDREN UNDER FIVE YEARS OF AGE

Studies on mortality differentials have highlighted the fact that the level of mortality is strongly correlated with development. This relationship is, of course, supported by the empirical evidence that, in general, countries with the highest incomes also have the highest levels of health services and education, much better control of their environment and the highest nutritional status. Thomes Mackeown's work on English data identified a rising standard of living as the most important cause of increased life expectancy, but, as Preston pointed out, Mackeown's arguments were based principally on a period during which the increase in average life span was not spectacular. 8/

The debate stimulated by Mackeown was further heightened by studies from developing countries on the role of preventive and therapeutic medicine in effecting significant declines in mortality. Newman's study on Sri Lanka and Macrae's study on the Solomon Islands attempted to illustrate the influence of malaria eradication on mortality decline. 9/ However, no such success story of malaria eradication has been reported for any country on the continental territory of Africa and research has focused attention on socio-economic factors such as occupation, education, residence and income. 10/ Analyses for the most part have centred on identifying differentials in levels of mortality among chosen categories of women, communities or regions. Brass has pointed out that even for developed countries the key limitation in analysis of mortality differentials is the lack of details of socio-economic characteristics in the death record and the difficulty, for the features that are reported, of finding the numbers at risk on a comparable basis in the population. 11/ Although he acknowledges that the traditional vital registration system can provide good measures for well-defined groups classified by age, sex, area of residence, religion, etc., African data for these categories are fraught with errors of grouping which make the assessment of separate effects rather a speculative exercise. Notwithstanding these problems, evidence from studies in African countries has shown significant differences in childhood mortality according to such variables as maternal education and occupation, household income and the availability and use of medical services.

It has come to be acknowledged that certain key indicators influence expectation of life at birth at the macro level. Some of these indicators, presented in table 7 show that the combined effect of the medical team density index, adult illiteracy and percentage of female enrolment in primary school correlates with the level of life expectancy at birth.

Thus, as can be observed in table 7, a high medical team density index and a relatively high level of school enrolment for girls tend to be correlated with higher expectation of life at birth. Although adult illiteracy rates are still relatively high for most African countries, the data from Mauritius suggest that low levels of adult illiteracy and a high medical team density index are associated with greatly reduced childhood mortality as reflected in the relatively high level of life expectancy at

Table 7. Selected health, educational and nutritional indicators for selected African countries, south of the Sahara

Region/Country	Medical team density (per 100,000)	Adult illiteracy rate	Percentage enrolment in primary school		Kilo calories per capita per day	Expecation of life at birth
			Boys	Girls		
Africa	101.2	62.5	66	53	2250	49
Benin	45.3	75.0	57	27	2260	46
Ghana	95.7	51.5	80	62	2320	48
Ivory Coast	74.4	59.0	91	58	2430	46
Liberia	79.4	74.5	44	28	2170	53
Nigeria	68.6	70.0	79	79	2270	48
Senegal	90.0	77.5	51	34	2370	42
Sierra Leone	44.0	93.0	41	29	2280	48
Burundi	22.6	77.0	18	12	2040	41
Ethiopia	6.2	94.0	23	12	2160	39
Kenya	146.8	50.5	101[a]	89	2360	54
Madagascar	49.7	66.0	100	100	2530	46
Malawi	35.0	63.5	70	48	2210	46
Mauritius	207.0	15.5	86	85	2360	64
Tanzania	-	26.0	113[a]	94	2050	51
Zambia	80.5	31.5	101	89	2590	48
Cameroon	73.3	49.5	80	68	2410	46
Central African Republic	20.4	60.5	74	40	2220	42
Congo	200.9	50.0	100	100	2260	46
Zaire	50.0	42.0	75	57	2060	46

Sources: Population Reference Bureau, 1982; World Children Data Sheet; UNESCO, Statistical Yearbook 1981, table 3.2; Demographic Indicators of Countries: Estimates and Projections as Assessed in 1980 (United Nations publication, Sales No. E.82.XIII.5); World Health Organization, Sixth Report on the World Health Situation 1973-1977, part I (1980), pp. 263-264.

[a] Percentage inflated by age misreporting and pupils over 11 years in first level.

birth for that country. Although these data contain many errors, the percentage of female enrolment at primary school is positively correlated with the expectation of life at birth (r = .51). The estimate of average life span for the Congo was certainly an underestimate given the high index of medical team density and the very high male and female enrolment rates.

Although the medical team density index relates total medical and paramedical staff to the total population, its usefulness in comparative studies of factors which influence childhood mortality is limited by the variation in geographical distribution of health infrastructure and manpower over the territorial boundaries of countries. Its usefulness in analyses of this kind is also limited by variation in the level of accessibility and frequent use of health services by the majority of the population. In this context the data in table 7 show that in Mauritius, where health services are more evenly distributed over a small territorial area, the high medical team density index is correlated with a high expectation of life at birth. Similarly, significant improvements in the provision of health services in Kenya, Ghana and Zambia are reflected in relatively high medical team density indices and expectation of life at birth. The contrasting evidence from Senegal is certainly the result of the greater concentration of medical and paramedical personnel in the capital city and a few other urban centres.

A number of studies in the African region have analysed the influence of occupational status, type of residence, religious affiliation and ethnic group on the level of infant and childhood mortality. 12/ These studies identified higher rural than urban infant and childhood mortality and significant variations in childhood mortality among different geographical regions, and indicated that infant and childhood mortality levels were significantly influenced by adult literacy rates, number of persons per hospital bed and indices of health conditions. 13/ There is growing evidence both from developed and from developing regions of the world that maternal education exerts a very significant and independent influence on the level of infant and childhood mortality. Caldwell presents evidence from his study in Nigeria to show that maternal education displays the steepest gradient, suggesting that this characteristic is the single most important determinant of the level of child mortality. 14/

In a recent study on the Sudan, Farah and Preston have underscored the point that many determinants of child mortality are properties of the household in which the child is located. These include levels of household income, adult literacy, health practices among members, sanitary facilities, etc. Although other factors, such as ecological characteristics, availability of land resources and the presence of disease vectors, also play a role, the evidence from Sudan supports the widely held view that infant and childhood mortality declines steadily as maternal education increases. 15/ Similar evidence from a survey in Zambia also suggests significantly higher childhood mortality among the children of women with no education than among the children of educated women. The differences, as illustrated in table 8, are important for all areas studied.

These data indicate that children born to mothers without formal education in squatter settlements of Lusaka experienced a mortality rate three times as high as that of their counterparts whose mothers had secondary or

Table 8. Deaths per 1000 children ever born to women in three residential areas by level of maternal education, Lusaka, Zambia

Level of education	Low density areas	High density areas	Squatter areas
No education	67.5	126.4	146.6
Grades 1-4	61.5	98.6	102.7
Grades 5-7	52.0	65.8	55.6
Secondary and higher	41.2	42.0	49.4
Total	52.2	87.2	131.2
	Mortality Ratios		
Secondary	100	100	100
Grades 5-7	126	157	113
Grades 1-4	149	235	208
No education	212	300	297

Source: Unpublished data for Zambian Survey on Interrelationships among Infant and Childhood Mortality, Socio-economic Factors and Fertility (ECA/PD/WP/1982/7).

higher education. It is noteworthy that even in the low density areas where housing and sanitary conditions are relatively good, the difference is still very significant.

AREAS OF DEVELOPMENT POLICY LIKELY TO EFFECT SIGNIFICANT DROPS IN CHILDHOOD MORTALITY

The influence of maternal education and of general adult literacy levels on infant and childhood mortality have significant policy implications. Since maternal education tends to correlate positively with improved housing, increased food supply, better maternal care, better environmental control, more medical care and increased family planning practice, national policies and programmes aimed at reducing infant and childhood mortality will yield the best results if they are incorporated in activities related to maternal and general education.

There is increasing evidence from the developing countries that measures to reduce infant and childhood mortality can be successfully introduced by applying imported "medical technology". The eradication of major endemic diseases such as smallpox and yellow fever and the reduction of the case fatality rates of measles, malaria and diseases of the respiratory system among children under five in African countries, as elsewhere in the world, bear testimony to how much success national action in improving water supply, housing conditions, sanitation and immunization can yield.

Notwithstanding these positive indicators, the rapid growth of urban centres in African countries has in recent years exceeded increases in investment in housing, medical infrastructure, sanitation and sewage facilities. The city has become an important vector for the spread of major killers and health-debilitating diseases. Consequently, the relative contribution of infectious, parasitic and respiratory diseases to mortality in African countries has not changed much in the last 20 years and future improvements in childhood mortality would require more effective programmes capable of raising the living standards of the population.

Although in recent years there has been a great emphasis on the development of primary health care services as a useful programme for reducing current high levels of childhood mortality, evidence from studies of mortality differentials in Africa suggests that improving the educational status of women would greatly increase the success of such programmes. Disease patterns in general reflect living standards and the way of life of the population. Poverty, malnutrition, high morbidity and high infant deaths are simply indices of underdevelopment. Imported medical technology to combat these problems can have only temporary or limited success unless programmes are backed up by activities to improve general living standards, develop resources and provide a suitable infrastructure for their exploitation and utilization. A catalyst element in the development of these activities is universal education in general and maternal education in particular.

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C. Mortality decline and health policy: an overview of developing countries of the Asia-Pacific region

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INTRODUCTION

Information on levels, trends and differentials in mortality is far from complete in most of the developing countries of the Asia-Pacific region. Not surprisingly, the situation varies considerably among different countries or areas within the region. Estimates of mortality levels and trends are inadequate in parts of South and South-East Asia: Bangladesh, Burma, Bhutan, Democratic Kampuchea, India, the Lao People's Democratic Republic, Nepal and Pakistan. Some estimates based on incomplete death statistics are available for Indonesia, Malaysia, the Philippines, the Republic of Korea and Thailand. Complete death statistics are available only in Australia, Brunei, Hong Kong, Japan, Peninsular Malaysia, New Zealand, Singapore and Sri Lanka, but even in these countries or areas very little analysis of such statistics has been undertaken in terms of causation, determinants and consequences of mortality. As regards morbidity, the situation is even much worse, particularly in the developing countries of the region.

In most of the countries the information on morbidity and the causes of mortality is highly deficient. Only the few developed countries of the region where the levels of mortality are already low have the recorded cause-statistics. In the developing countries only the hospital-based sicknesses and deaths get recorded according to causes. But these account for only small fractions of total cases in these countries, because in rural areas, where high percentages of the people live, most of the sicknesses or deaths remain unattended by a physician. The major health problems as reported by the national health administrators in the 1950s and mid-1970s remain practically the same. Tuberculosis continues to be a common disease and malaria has returned to some of the countries. Most of these countries recognise malnutrition, undernutrition and the diarrhoeal diseases as major health problems. 1/ This, in a nut shell, is the background which must be kept in mind before considering any health or social policy to ameliorate the situation of mortality or morbidity in the developing countries of the region.

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Scope of the Paper

The life expectancy at birth (e_o^o) in Asian and Pacific countries ranges from the world's highest level in Japan (male 73.9, female 79.3) to one of the lowest in Afghanistan (male 37.0, female 37.8). For the sake of simplicity, the countries are classified according to the levels of life expectancy at birth into four categories: high mortality ($e_o^o < 50$), moderately high mortality ($50 \leq e_o^o < 60$), moderately low mortality ($60 \leq e_o^o < 70$) and low mortality ($70 \leq e_o^o$). In table 1, the 1982 estimates of life expectancy for the Asian and Pacific countries give the following groupings of the countries:

Table 1. Distribution of countries according to the level of life expectancy at birth, 1982

Mortality level	Countries
High ($e_o^o < 50$)	Afghanistan, Bangladesh, Bhutan, Democratic Kampuchea, Lao People's Democratic Republic, Maldives, Nepal, Pakistan.
Moderately high $50 \leq e_o^o < 60$	Burma, India, Indonesia, Kiribati, Papua New Guinea, Solomon Islands, Vietnam.
Moderately low $60 \leq e_o^o < 70$	China, Iran, Malaysia, Mongolia, Philippines, Republic of Korea, Samoa, Sri Lanka, Thailand
Low $70 \leq e_o^o$	Australia, Fiji, Hong Kong, Japan, New Zealand, Singapore

Source: ESCAP, Population Data Sheet, 1982.

The countries of the region falling in the low mortality group with a minimum of 70 years of life expectancy are naturally the developed countries, with the exception of Fiji. What is more noteworthy is the geographical distribution of the countries categorized in the three other groups. A closer look at table 1 shows that by and large the three groups according to the levels of life expectancy conform to three sub-regions of the region of the

Economic and Social Commission for Asia and the Pacific (ESCAP). The countries in the high mortality group all come from South Asia, with the exception of Democratic Kampuchea and the Lao People's Democratic Republic; the moderately high mortality group includes India, the relatively less developed area of South-East Asia, and Papua New Guinea, and two other small countries of the Pacific; and the moderately low mortality group includes the countries of East Asia (except Japan and Hong Kong), Iran, the relatively more developed area of South-East Asia, and Sri Lanka. This gives a general indication of improvement in mortality as one moves from South Asia towards East Asia. This paper will, however, focus on the declining trends of mortality during the last two decades and the recent health policies and programmes in selected countries of the last three groups - high (Bangladesh, Nepal and Pakistan), moderately high (India, Indonesia and Papua New Guinea) and moderately low (China, the Philippines, Sri Lanka and Thailand), levels of mortality.

HIGH MORTALITY COUNTRIES

Although there has been a general decline in the levels of mortality in most of the countries of the ESCAP region, in a few South Asian countries this decline appears to have slowed down considerably during the 1970s. Bangladesh, Pakistan and Nepal, among others, have experienced this slowing down at considerably higher levels of mortality.

In Bangladesh the declining mortality trend as reflected in the increase of e_o^o can be perceived as taking place in two stages. The first stage covers the period prior to 1941 and is characterized by a slow gain in life expectancy. During this phase this e_o^o increased by only 10 years. The second phase started in the following decade, when life expectancy increased by about 15 years between 1941 and 1961. During the 1970s the downward trend in mortality was arrested, partly because of the devastating cyclone in November 1970, the war of independence in 1971 and the subsequent disruption of rehabilitation caused by a major famine in 1974 resulting from a fragile economic base, a poor transport and communication system and inefficient food distribution.

The declining trend in mortality since the 1920s is probably the result of the health measures that largely controlled the major epidemics of plague, cholera, malaria and smallpox, and to some extent the improvement in living standards. The infectious diseases such as diarrhoea, tuberculosis and parasitic infestations have been endemic almost throughout the country. Large-scale programmes have been undertaken to reduce infant and child mortality by establishing maternity and child welfare institutions. Smallpox was largely controlled by 1970, and in 1976 the country was ultimately declared free from smallpox. An anti-tuberculosis programme of GCG vaccination has been operational since the 1950s. Malaria, once largely controlled through the use of DDT, has reappeared at some places as a result of the vectors developing immunity against DDT and the relaxation of surveillance. Diarrhoeal diseases of the cholera and gastro-enteritis types are still prevalent. Mortality in childhood occurs mostly from infectious diseases such as dysentery, whooping cough, measles and diphtheria.

One of the causes of the recent stagnation in mortality levels is the poor living conditions of the majority of the population, particularly in the rural areas. The chronic malnutrition often makes the situation worse. Poverty, along with lack of knowledge of proper hygiene and health care and the poor availability of health services in the rural areas, accounts for the low status of the health of the population. 2/

Although the health infrastructure and manpower have expanded during the plans, minimum health care has yet to reach the vast majority of the people, particularly in the rural areas, where 90 per cent of the people live. Of the 8,500 doctors now available in the country, less than 10 per cent are in the rural areas. Of the 15,493 hospital beds, only 3,800 beds (24.5 per cent) are in the rural areas. Severe shortages of medical assistants, nurses and paramedics, particularly in the rural areas, make the situation still worse. Thus the accessibility of the rural masses to modern health care is very limited.

While minimum medical care for all is the immediate goal, health for all by 2000 A.D. is the broad national objective and primary health care, as a major component of health services, has been accepted as the key to attain this objective. With that central theme, the Second Five-Year Plan of Bangladesh (1980-1985) established the following objectives for health development: (i) to bridge the rural-urban gap and generally to increase quality and coverage of the health care services with a view to providing minimum medical care to all; (ii) to effectively control the major communicable diseases and to expand preventive and promotive measures with a view to establishing a comprehensive health care system; (iii) to provide improved health and family planning services in a package to the family with a view to increasing its welfare; and (iv) to develop indigenous and homeopathic systems of medicine and integrate them into the health care services.

Nepal, another least developed country in South Asia, has a very high level of mortality. Several life tables for Nepal constructed on the basis of the population census as well as sample survey data indicate that there has been an increase in life expectancy over the years. During the 1950s and 1960s the life expectancy for both the sexes increased from around 25 years to over 40 years, but during the 1970s the increase was very small, showing a clear slowing down of the decline in mortality. Despite the recent increase in life expectancy, Nepal still has one of the highest mortality rates in the low income countries. As in Bangladesh, malnutrition, measles, tuberculosis and other respiratory diseases and water borne intestinal infections are still a great hazard to the general health of the population. The number of doctors and the number of hospitals and hospital beds are far from adequate. 3/

The mortality in Pakistan showed a rapid decline in the 1950s and the 1960s. The rate of decline has, however, slowed down in recent years. Life expectancy increased from 43.0 years during 1955-1960 to 50.8 years during 1975-1980. 4/ The present level of life expectancy is estimated to be around 52.0 years.

Health facilities and personnel in Pakistan are scarce and heavily concentrated in urban areas. It is estimated that health services are available to only 15 per cent of the total population in the country and probably to only 5 per cent of the rural population, which constitutes 75 per cent of the total population. During the last two decades there has not been much improvement in the medical sector, particularly in ratios of population per doctor, nurse and hospital bed. Most of the health efforts through existing mechanisms are fragile and can cater only to partial curative needs of the country. 5/

MODERATELY HIGH MORTALITY COUNTRIES

At the beginning of the century the national estimate of the expectation of life at birth in India was around 23 years. During the 1950s it increased to over 40 years and by the mid-1970s to over 50 years. This steady increase in life expectancy was achieved through several measures: elimination of famine through higher agricultural production, effective control of food grain procurement and distribution and improved techniques of food scarcity relief; control of epidemics through development of public healh and medical services, inoculation and vaccination; and environmental sanitation and international co-operation for disease control. 6/

Although there has been considerable improvement in life expectancy during the last two to three decades, there still exists a wide gap in rural areas between the requirements and the availability of health services. In order to carry the services nearer to the rural people it is proposed to establish one primary health centre for every 30,000 population in the plains and 20,000 population in hilly and tribal areas, with a sub-centre for every 5,000 and 3,000 populations respectively in those areas. To provide at least minimum service to rural villagers, a village health guide, preferably a female, is being provided in every village. Up to April 1982, 200,000 village health guides had been trained. In order to provide delivery services in hygienic conditions to pregnant village women, about 350,000 traditional birth attendants had been trained up to April 1982. 7/

In Indonesia mortality was extremely high during the period preceding the Second World War. Life expectancy varied from 30 to 35 years. 8/ During the 1940s various islands suffered from tremendous population displacements and severe food shortages as a result of foreign occupation from 1943 to 1945 and subsequently the war of independence from 1945 to 1949. This caused an increase in mortality. During the 1950s a downward trend in mortality started, although in a slow and erratic way, and life expectancy increased to a level not higher than 35 to 38 years. 9/ The decade of the 1960s also saw a continuing decline in mortality and a further rise in life expectancy, reaching 47 years by 1971. 10/ During the 1970s, although there was some decline in mortality the increase in life expectancy was much smaller than in the previous decades.

Very little information is available about the mortality trends in Papua New Guinea prior to the end of the Second World War. Calculations made by Van de Kaa indicate that life expectancy at birth in Papua New Guinea may have risen from 32 years for males and 31 years for females in 1944 to 43.75 and 43.25 years respectively in 1966. 11/ Available evidence suggests that life expectancy rose further to about 49.2 years by 1971 12/ and about 53.2 years for males and 52.7 years for females by 1980. 13/ Declining mortality has been associated with the expansion of preventive medical services and malarial eradication programmes and the spread of the new concepts in diet and hygiene. Immunization programmes aimed at reducing the incidence of tetanus, diphtheria, pertussis and tuberculosis have also been instituted. Other factors responsible for declining mortality include the expansion of the hospital/aid post system and the introduction of a road network, making these services available to a larger proportion of the population.

The National Health Plan of Papua New Guinea, 1974-1978, taking ecological, epidemiological and demographic factors into consideration, focussed on seven problems as the most important factors in planning health services: health standards were worst in rural areas and the highlands and among young children; average family size was increasing; the demand for urban hospital services was increasing; inequalities in the distribution of health services existed; services were poorly integrated; too many decisions were made centrally; and health standards were unrealistic. Keeping those problems in view, the national health objectives were established. In order of priority the first six were: (i) to provide basic health services equitably among the people; (ii) to provide malaria control to the entire country; (iii) to provide a health education programme concerned specially with the priority barriers to health improvement; (iv) to control tuberculosis and leprosy; (v) to decentralize decision-making and promote community involvement; and (vi) to control diseases arising from defective environment.

MODERATELY LOW MORTALITY COUNTRIES

Before 1949 China ranked among high mortality countries. During 1949-1981 mortality steadily declined, to a level of 6.36 per 1,000 population. 14/ The life expectancy in China was estimated to be between 20 and 25 years in 1930. 15/ By 1972-1975 it had increased to a level of 61.7-64.4 years. Thus, during that four-decade period, China gained on average about one year in life expectancy for every calendar year. Since there was a decline in mortality after 1949, China probably gained an approximate 1.5 years of life expectancy per year. This is undoubtedly an unprecedented rate and extent of increase in life expectancy for any populous developing country. 16/ The life expectancy further increased to 65.0 years for males and 68.0 for females by 1981. 17/

Over the past 30 years cause-specific mortality rates of diseases of the respiratory system, pulmonary tuberculosis, diseases of the digestive system and acute infectious diseases have fallen considerably. 18/ In areas of higher life expectancy, cardio-vascular diseases, malignancies and cerebro-vascular diseases have become more important problems, and in other areas the more traditional pattern of diseases has remained as the main problem.

This section dealing with China's health policies and programmes draws heavily on the paper by Kane. 19/ Priorities for health care were set in 1950 in a National Health Work Conference. 20/ They were: (i) health care must serve the people - workers, peasants and soldiers; (ii) priority must be given to prevention of diseases, with prophylaxis and treatment combined; (iii) health campaigns should be conducted and co-ordinated with other mass compaigns; and (iv) scientific and traditional medicine should work together and eventually be integrated.

Mass campaigns to eradicate "the four pests" - rats, flies, mosquitoes and bedbugs; to limit schistosomiasis by redigging irrigation canals; and to identify and treat venereal diseases have been carried out with nationwide publicity. A very large number of grass-root medical aids have been given training to detect ailment, to persuade the sufferer of the importance of treatment, and in many instances to carry out the treatment. Two major causes of morbidity and mortality have been controlled primarily through public education. The importance of boiling water and of developing sources of pure water supplies have been stressed continually. Malnutrition was another traditional problem in China. In public education great efforts have been made to ensure an understanding of the elements of a balanced diet for the population at large and also for target groups such as children or pregnant/nursing women.

The Philippines is another country which has made considerable improvement in mortality rates during the last few decades. The Bureau of Census and Statistics estimated the life expectancy for the Philippine population in 1902 to be 12.7 years. The crisis resulting from severe cholera and smallpox epidemics in 1902-1904 may have been the cause of this low life expectancy at birth. In 1918 the Philippine life expectancy was 25.61 years, which was comparable to India's 26.75 years around that period. The Philippine population was in that year subjected to an influenza epidemic and another smallpox epidemic. During the next 20 years life expectancy rose to 46.22 years, or about 80 per cent over the 1918 level. During 1938-1948 life expectancy increased modestly, to 49 years for males and 53 years for females, widening the gap in favour of females partly because of the effects of the Second World War on male mortality. During 1948-1960 life expectancy increased by small amounts, to 51.17 years for males and 55.00 years for females. By 1970 these levels had increased further to 55.2 for males and 60.9 for females. 21/

The National Plan of the Philippines for 1980 has the following health development objectives: (i) to reduce morbidity rate, infant mortality rate and crude death rate; (ii) to provide an additional 10 per cent of total households with sanitary toilets; (iii) to make drinking water from potable sources available to an additional one tenth of the population; (iv) to reduce second and third degree malnutrition to manageable levels among the vulnerable population; and (v) to reduce the annual population growth. Some of the more important health development programmes in the Philippines are: primary health care, communicable disease control, environmental sanitation, national health manpower development, pollution control, nutrition, medical care, maternal and child health and family planning.

Until about the early 1920s mortality in Sri Lanka remained at a high level. A definite upward trend in life expectancy has been noticeable since 1921. Though there have been occasional bad years, the period 1921-1945 may be regarded as one of slow improvement in life expectancy from the levels of 32.6 years for males and 30.6 years for females. Among the factors which may have contributed to the gradual increase are the improvements in medical and public health services, environmental sanitation and provision of educational facilities.

Sri Lanka's post-war mortality decline has been treated as a classic phenomenon in the demographic literature. By 1946 the life expectancy had increased to 43.8 years for males and 41.5 years for females. This rapid increase has been attributed to the effective introduction of DDT to eradicate malaria and the improvements in health facilities, such as rural hospitals and maternity homes, paramedical services and the distribution of free milk. The further improvements in life expectancy that followed the rapid increase after 1947 and were sustained through the 1960s and into the 1970s were the result of the growth in the country's health care system and in the improved production and distribution of food. Life expectancy increased by 1971 to 64.0 years for males and 66.9 years for females. 22/ The latest estimates for 1982 are 65.6 years for males and 68.7 years for females. 23/

Sri Lanka provides extensive health care for the entire population through a well-organized primary health care system. This primary care is supported by a referral system of clinics and hospitals staffed by physicians and supporting personnel. In addition, the indigenous system of medical care known as "ayurvedic medicine", supported by the Government, continues to complement the services available under the Western system of medical care.

The Government of Sri Lanka has been subsidizing basic food items such as rice, wheat flour and sugar for over 30 years. Food subsidies, to the extent that they have reached the poorest people in Sri Lanka, have helped to reduce mortality, particularly infant and maternal mortality. Infant mortality has declined from 141 per 1,000 live births in 1946 to 37 in 1978. The improvements in health care facilities and nutrition have no doubt played an important role in the increase of life expectancy at birth. 24/

In Thailand there has been a steady decline in mortality during the period from 1937 to 1970. Life expectancy has increased for males from 38.94 to 55.53 years and for females from 41.73 years to 59.80 years. 25/ The latest estimate puts the life expectancy in 1982 at 60.6 years for males and 64.6 years for females. 26/

Although during the last two decades there has been a significant reduction in the death rate and an increase in life expectancy through improvements in health development programmes, Thailand still faces the public health problems of high morbidity, distribution of health services and health personnel in the rural areas and public participation in health developments. The Fifth Plan attempts to improve primary health care and public health services in the rural areas. The policy on medical care for the poor and aging people is integrated for the first time in this plan and aims at reducing the death rates by 50 per cent each for typhoid and polio diseases; 25 per cent each for dysentery, respiratory and venereal diseases; and 60 per cent for goitre. The rate of morbidity caused by malnutrition during infancy and early childhood will be lowered.

The old hospitals in 75 districts will be improved and new hospitals will be built; new health centres will be constructed in 1,000 communities, while the status of 1,030 midwifery stations will be raised to health centres during 1982-1986. As regards development of health personnel, 3,970 new physicians, 35,370 nurses, 3,950 midwives and 5,000 health workers will be trained during the Plan period. At the community level, 35,000 village health volunteers and health communicators will be selected and trained to assist in health improvement in their villages. 27/

SPECIAL HEALTH INTERVENTION PROGRAMMES

Primary health care (Philippines)

The most recent government health service programme is the primary health care system. The primary aim of this programme is the continuous improvement and maintenance of the health status of the community with emphasis on basic health care, nutrition, family planning and community participation and involvement in action programmes or activities that will meet the needs of the community. 28/

Medicare (Philippines)

Medicare is a recently introduced social programme of the Government which provides a compulsory health insurance scheme where the members contribute to a pool and from which are drawn payments for medical care services rendered to them or to the members of their families. This medical care plan implements the policy of the Government gradually to provide comprehensive medical care according to the needs of the patient, and a co-ordinated use of government and private medical facilities such as public service instrumentalities for the people. Covered under this plan are the members of the Government Service Insurance System and the Social Security System.

Lampang Health Development Project (Thailand)

Primary health care activities on a small scale have a long history in Thailand. In 1960 the Ministry of Public Health launched a nationwide sanitation campaign - the Village Health and Sanitation Project - which was designed to reduce the high incidence of water- and filth-borne infectious diseases. The project helped stimulate community participation in order to improve conditions in rural areas. The training of traditional or "granny" midwives to use aseptic techniques to reduce the incidence of neo-natal, perinatal and maternal mortality was another innovation of the Ministry. In 1974 it launched the Lampang Health Development Project - a major undertaking to develop and test an innovative low-cost integrated government health care delivery system. The overall objective of the project was to expand health care coverage to at least two thirds of the rural target population - women of childbearing age and pre-school children. In order to achieve this goal the project developed the following strategies: (i) development of community health volunteers - health post volunteers, health communicators and traditional birth attendants; (ii) involvement and co-operation of the community and the private sector; (iii) training and development of Wechakorn paraphysicians; and (iv) reorganization and integration of the provincial health service infrastructure.

The Lampang experience suggests that more integration can be achieved despite the historical separation of "medical care" and "public health services". The administrative reorganization placing all provincial hospitals and health services under a provincial health officer helped to expedite the integration goal. A major contribution of the project to integrated health services was the organization of the community health department at the provincial hospital. "Integration" of the private sector in an overall government co-ordinated health care system was difficult. It is possible to reach a large proportion of the target population within a relatively short period of time. As a result, in some areas of the project all deliveries were attended by trained personnel. Pre-natal and post-natal care, however, required improved supervision and follow-up. The problems of immunization were compounded by the special requirement of bringing the appropriate biological material to the villages in viable condition. 29/

Treatment and control of diarrhoeal diseases (Bangladesh) 30/

Diarrhoeal disease is not only a major cause of death in Bangladesh, but also a great deterrent to an improvement in quality of life. To address this major health problem of Bangladesh and other developing countries, the International Centre for Diarrhoeal Diseases Research, Bangladesh (ICDDR, B), field-tested cholera vaccines and conducted hospital-based therapy at its research laboratory in Dacca, and at field stations - one at Matlab, a rural centre 44 miles south-east of Dacca, and the other at Teknaf, a rural area near the south-eastern tip of Bangladesh. Based on 118,421 cases, the rate of case fatality was estimated to be less than 1 per cent. A review of clinical records showed that 47 per cent of the in-patients would have died in the absence of the ICDDR, B treatment facilities. 31/

ICDDR, B has launched two other approaches to interventions for the diarrhoeal disease - a village-based oral therapy programme and a home-based oral rehydration programme. In the former, female village workers and indigenous medical practitioners are given training in administering locally produced sucrose-electrolyte oral therapy and practical demonstrations of oral rehydration and management of diarrhoea. Under the home-based oral rehydration programme, one village woman from a "bari" (collection of households of related families) is trained to mix and administer oral therapy and provide the materials to "bari" members as needed. An evaluation of post-training results has shown a significant drop in the hospitalization rate compared to control area without training.

Maternal tetanus and immunization programme (Bangladesh)

Tetanus is a major cause of infant death in Bangladesh. Approximately one half of all infant deaths are neo-natal deaths. Possibly about one third of these neo-natal deaths are caused by tetanus transmitted by contamination of the umbilical cord at the time of delivery. In rural Bangladesh, where most of the deliveries occur at home, unattended by qualified midwives, it is very difficult to improve the quality of obstetrical services. In 1974 ICDDR, B launched a maternal tetanus immunization programme with two injections of an aluminium-absorbed tetanus toxoid on a schedule of 0.5 me. at a minimum of four weeks later, preferably one month before delivery date. The findings of this programme have provided clear documentation of the impact of neo-natal mortality of the active immunization of pregnant women with two tetanus injections. There are, however, certain limitations to this programme. The acceptance rate by pregnant women is low (33 per cent); and in the absence of a system of continuous recording and updating of menstrual history it is rather difficult to identify the pregnant women and to contact them in time for vaccination.

SOME POLICY CONSIDERATIONS

It can be observed from the experience of several countries discussed earlier that there exists among the developing countries of the Asia-Pacific region a great diversity in terms of the socio-economic conditions in general, which are closely linked to the status of health. Although there is a great deal of similarity in the basic health problems, at least in the high and the moderately high mortality countries, there exist wide variations in the policy and management of health. This section will focus on some more common problems and an attempt will be made to highlight some issues for the development of health and hence for the reduction of mortality and morbidity.

Basic health problems

The survey of the World Health Organization on the major health problems in South and East Asia summarizes the problems as viewed by the key national health administrators. An extract of the relevant portion of this summary is reproduced in table 2 (Annex I). The table shows that the general health problems in the high and the moderately high mortality countries have remained more or less the same during the last two to three decades, except for the disappearance of smallpox. Malaria seems to be common to every country. Although its prevalence had been reduced in some countries, it is reappearing. Infectious and parasitic diseases are almost universal in these countries, particularly in the rural areas, where the problems of sanitation and potable water are very acute. Malnutrition adds to this problem. Acute diarrhoeal diseases often assume epidemic proportions during the dry seasons and take a heavy toll of life. Tuberculosis, whooping cough and leprosy are equally important health problems in these countries.

Health facilities and personnel in these countries are far from adequate. Table 3 (Annex II) gives the basic health indicators around 1980 in terms of the infant mortality rate, population-hospital bed ratio, population-doctor ratio and percentage of literacy. Bangladesh, Nepal and Pakistan and also India, Indonesia and Papua New Guinea have infant mortality rates at levels above 100. In Nepal there is only one doctor for nearly 33,000 population. The corresponding figures for Indonesia and Papua New Guinea are respectively 12,620 and 17,200. Bangladesh and Nepal have only one bed for every 4,237 and 5,249 persons respectively. These figures not only are very inadequate for the total national requirements, but have a large urban-rural differential. The facilities are more concentrated in urban areas. The literacy figures show a similar picture in these countries. The countries with high levels of mortality have a percentage of literacy in the range of 20 to 25. The corresponding rates for the moderately high mortality countries are in the range of 30 to 60.

The situations in the countries with moderately low mortality levels are somewhat different from those in the other two groups. The cause pattern of mortality is fast changing. Although malaria, tuberculosis, gastro-intestinal diseases and malnutrition persist in some countries, the so-called developed countries' diseases have gradually started to become more visible. Heart diseases, malignancy and cerebro-vascular diseases are becoming more important at least in China and a few other countries. Infant mortality in these countries has come down to levels around the 40s and 50s. The countries have increased their health personnel and facilities to provide much greater and better services to their populations. China's success, for example, is largely the result of its strong and sustained policy of placing major emphasis on public health, prevention and paramedics. The situation in Sri Lanka is another example of rapid improvement in life expectancy through malaria control, improvement of rural hospitals and maternity homes and extension of paramedical services and food subsidies, including free distribution of milk. These countries, of course, put great emphasis on education. China, Sri Lanka and Thailand all have literacy rates above 70 per cent.

Health-related problems

A large number of developing countries today are facing a serious acuteness in health problems. The question arises, what causes this acuteness? It is difficult to find clear-cut answers to that question. Several explanations may be put forward. A modern doctor is reluctant to go to and work in a rural setting where he would face numerous problems relating to accommodation and housing, proper rural-urban communication, sanitary and safe water, etc. Modern medicinal/treatment technology which the doctors have been trained in and are more familiar with is not readily available in a rural area. At the same time, solving some very common tropical health problems of developing countries - malnutrition, diarrhoea and respiratory diseases - is not a major concern of the modern medicine in industrialized countries.

Political commitment by the developing countries, as Bell 32/ has pointed out, is another very important consideration for providing appropriate medical technology - hospital-based technology of clinical medicine *vis-a-vis* preventive, public health and community-oriented health care. The principle of adjustment - adapt, not adopt - in policies and programmes may provide the appropriate technology in health.

Another important consideration of health development is the conceptual framework of the process of health development - an integrated approach to national health *vis-a-vis* a sectoral approach under the ministry of public health. Proper and adequate nutrition, education in general and female education in particular, and even development of a network of roads and transport are all health promotional factors but are managed by different ministries or units of the government in each country. In order to make a concerted effort for health development an integrated approach is essential. But bringing about bureaucratic co-ordination is more easily said than done. The few countries/areas in this region which have ever succeeded in making great improvements in health and thereby in mortality reduction have done so through this integrated approach.

Another important issue which we tend to forget or attach very little importance to is health statistics and the related research. Before any health policy and programme is introduced a proper assessment of the situation obtaining in each country and experimentation with and evaluation of different health intervention programmes with a view to ascertaining their applicability and cost effectiveness are essential. In this respect one can, of course, learn a great deal from the experience in a similar situation in neighbouring countries.

Policy issues

Based on a limited analysis of the experience of these few countries an attempt will now be made to draw some conclusions which are expected to have policy relevance:

(1) Countries which are still experiencing high or moderately high levels of mortality can substantially reduce these levels by putting much greater emphasis on disease preventive actions, introduction of paramedical personnel and strengthening of public health measures.

(2) Improvements in basic education, particularly health and related education, will accelerate mortality decline. Female education will greatly improve family health and thereby more speedily reduce infant and early childhood deaths, which account for a high percentage of total deaths in these countries.

(3) An integrated approach to health development under which different ministries/agencies make their contributions is likely to have a greater impact on mortality reduction. Along with this general scheme of integration the indigenous system of medical care known as "ayurvedic medicine" in South Asia and "Chinese Medicine" in South-East Asia may be called upon to complement the services available under the Western system of medical care.

(4) An increase in per capita income through economic development is expected to reduce mortality. This reduction may be faster if the income is more equitably distributed among different segments of the population.

(5) More research on special health problems faced by the countries and on the adaptive technology of intervention programmes, as is being done on oral rehydration therapy and tetanus immunization at ICDDR, B, will effect more rapid reductions of mortality.

(6) The countries which have succeeded in bringing down mortality to a moderately low level and are now likely to experience more the so-called developed-country diseases, such as cancer and cardio-vascular disease, may promote changes in life-style through sound habits of diets and exercise in order to prevent these diseases.

(7) Accidents, particularly road accidents, are claiming an increasing number of lives as well as causing serious injury and permanent damage to the survivors. Effective traffic regulation and introduction of alternative modes of transport, as has been done in Japan and other developed countries, may considerably reduce accidental deaths.

(8) As a result of the rapid urbanization and industrialization that has been taking place in recent years, some of the developing countries are facing serious environmental degradation and pollution problems and the consequent health hazards. These countries may introduce necessary pollution control measures such as environmental standards, environmental pollution prevention plans, and provisions for damage compensation.

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Annex I

Table 1. Major health problems in selected ESCAP countries as viewed by national health administrations around 1955 and 1975[a]

Mortality level and country	Major Health Problems	
	around 1955	around 1975
High Mortality		
Bangladesh		Diarrhoea, Dysentery Malaria Leprosy Tuberculosis
Nepal[b]	Infectious diseases Digestive diseases Diseases of the eye, ear and skin	Malnutrition Tuberculosis Measles Intestinal infection
Pakistan[c]		Malaria Tuberculosis Cholera, Typhoid Whooping cough Diphtheria Tetanus Measles
Moderately High Mortality		
India	Small pox Cholera Plague Malaria Tuberculosis	Infectious diseases (no further specification)
Indonesia	Smallpox Plague Diarrhoea Tuberculosis Malaria	Cholera Malaria Diarrhoea Tuberculosis Infectious diseases (no further specification)

Annex I (cont'd)

Mortality level and country	Major Health Problems	
	around 1955	around 1975
Moderately High Mortality (continued)		
Papua New Guinea[d]		Respiratory diseases, including pertussis Malaria Gastro-intestinal diseases Tuberculosis Accidents, injuries Leprosy Venereal diseases
Moderately Low Mortality		
China[e]	Diseases of respiratory system Pulmonary tuberculosis Diseases of digestive system Acute infectious diseases Heart diseases Cerebro-vascular disease Malignant neoplasm	Heart diseases Malignant neoplasm Cerebro-vascular disease
Philippines	Malaria Tuberculosis Malnutrition Sanitation	Malnutrition Sanitation Malaria Schistosomiasis
Sri Lanka	Tuberculosis Filariasis Veneral diseases Sanitation	Malaria Venereal diseases Gastro-intestinal diseases Malnutrition Leprosy
Thailand	Infectious diseases (no further specification)	Malnutrition Whooping couth Diphtheria Malaria Leprosy

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[a] The listing of the problems does not necessarily indicate hierarchical ranking.

Annex I (cont'd)

b/ In a recent United Nations publication, National Experience in the Formulation and Implementation of Population Policy, 1960-1976 (ST/ESA/SER.R./34), one finds the following statement: "It has been suggested that the health problems of Nepal, beyond the provision of a basic medical establishment, are not as severe as originally believed" (p.9). This statement is based on the results of a health survey in 19 villages in 1965-1966 where an average daily calorie intake of 2,442 was found, a value "slightly above the WHO average standard" (ibid.). The following points must be made here: A lack of basic health care is not a health problem per se but a handicap in the fight against health problems. It is odd to see that a United Nations report completely ignores the results of the fourth World Food Survey (Food and Agriculture Organization, Rome, 1977) where the daily calorie intake was estimated at 2,015, a discrepancy of considerable magnitude which cannot be explained by different reference periods. The United Nations report does, however, contain a word of caution concerning generalizations from a survey of only 19 villages and refers also to some of the statistical problems inherent in such an attempt. Unfortunately, the "WHO average standard" is not directly referenced and a publication from a university in the United States of America is quoted as the source. However, as this publication is dated 1969, the WHO standard cannot be the Handbook of Nutritional Requirements, which was published in 1974 (WHO Monograph Series, No. 61, Geneva, 1974).

c/ These health problems, among others, have been mentioned under the health sector of the Annual Development Plan of Pakistan, 1980-1981.

d/ The National Health Plan, 1974-1978, Papua New Guinea, listed these diseases as major health problems.

e/ The diseases mentioned in the two columns (around 1955 and around 1975) were in fact the main causes of death during 1955-1959 and 1974-1975 respectively. During these 30 years the pattern of causes of death changed considerably. See Rui-Zhu Ling, "A brief account of 30 years' mortality of Chinese population", in Mortality in South and East Asia; A Review of Changing Trends and Patterns, 1950-1975, Manila, 1-5 December 1980 (WHO/ESCAP, Geneva, 1982), pp. 287-296.

Annex II

Table 2. Basic health indicators for selected ESCAP countries, 1980

Mortality level and country	Infant mortality rate a/	Population per hospital bed	Population per doctor	Literacy rate
High Mortality				
Bangladesh	133	4,237*	8,036	22.2(5≤age, 1974)
Nepal	145	5,249	32,957*	24.3(1979-1980)
Pakistan	120	1,720 b/	6,000 b/	22.0(1972)
Moderately High Mortality				
India	119	1,412*	3,556	34.5(1971)
Indonesia	109	1,541	12,620	57.7**
Papua New Guinea	100	240*	17,200	42.3
Moderately Low Mortality				
China	42	368 c/*	2,458 c/d/*	76.5
Philippines	51	650**	2,566(1979)	
Sri Lanka	40**	340	7,173	80
Thailand	59**	752*	7,215*	70(1977)

Source: WHO Regional Office for South-East Asia, New Delhi, Regional Bulletin of Health Information, 1981.

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D. Findings of the World Fertility Survey on trends, differentials and determinants of mortality in developing countries

Secretariat of the World Fertility Survey

INTRODUCTION

The principal undertaking of the World Fertility Survey (WFS) has been to conduct a series of detailed and internationally comparable fertility studies. In the course of its activities, a vast body of information on mortality as well as fertility has been collected in each of the participating countries. The collection of information on infant and child death was in fact an integral part of the data collection procedure, the main object being to maximize the coverage of births in the samples. At the outset, expectations of obtaining good mortality data were not unduly high. Preliminary analyses indicated, however, that the infant and child mortality estimates were generally of much higher quality than originally envisaged. Given the paucity of information on mortality in many developing countries, it has even been suggested that the contribution of the WFS to obtaining more accurate estimates of mortality, especially infant and early childhood mortality, may equal or surpass its contributions in the field of fertility. 1/

SOURCES OF INFORMATION ON INFANT AND CHILD MORTALITY

The national fertility surveys conducted in conjunction with the World Fertility Survey programme provide several types of information on infant and child mortality. The standards WFS household questionnaire was designed to provide a listing of household members from which women eligible for interview could be seleted. Some countries supplemented the core household schedule with questions on the number of children ever born and still surviving, so as to provide information allowing the indirect estimation of infant and child mortality levels. 2/ Many countries, particularly those where death registration is either inadequate on non-existent, also included questions on the survival of the most recently born child and on deaths of household members during the 12- or 24-month period preceding the survey. 3/ Despite the wealth of data available from the household surveys, however, the principal sources of information on child mortality are the detailed interviews of women of reproductive age which were undertaken in the 42 developing countries that participated in the WFS.

Women interviewed in the individual survey were asked not only about the numbers of children they had borne but also about the timing of each of their confinements (whether a live birth or a stillbirth), the sex of the child and, if it had died, its age at death. The birth histories thus compiled allow estimation of child mortality levels and trends without recourse to indirect methods (which would involve various assumptions about age patterns of fertility and mortality, not all of which may be justified). More importantly, however, by linking the respondents' maternity histories to other demographic and social characteristics, it becomes possible to study mortality differentials, determinants of infant and child death and interrelations between childhood mortality and fertility.

Like any survey data the WFS maternity histories are not free from error. Detailed evaluations of the histories indicated that the outright omission of births was rarely a problem. Nevertheless, in most countries it was difficult to obtain accurate information on the dates of events since such dates often are neither routinely recorded nor indeed of much significance to the respondents themselves. Countries dealt with the problem of dating in a variety of ways (for example, by using event charts, historical calendars and additional special probes) 4/; but, in general, attempts were made to obtain both the month and the year of occurrence of each vital event.

In view of the widespread lack of reliable vital registration data in developing countries and the diversity of the countries surveyed, it is not possible to come to a definitive conclusion about the types and magnitudes of errors that exist in WFS mortality data. Nevertheless, internal consistency checks and comparisons with evidence from censuses, other surveys and, where possible, vital registration suggest that the overall quality of the data is remarkably high. 5/ Indeed, the evidence accumulated so far indicates that the WFS data on infant and child mortality are at least as good as and often better than other national data, and in only a few instances was there a demonstrably better source of information. 6/

RECENT LEVELS OF INFANT AND CHILD MORTALITY

Not only has the WFS provided direct estimates of infant and child mortality for countries about whose mortality little is known, but the estimates for many countries are higher than previously thought. Indeed, in 17 of the 18 countries for which it was possible to compare infant mortality estimated from WFS surveys with estimates from vital registration, the WFS figures were higher, sometimes by more than 50 per cent. In some countries in which vital registration is considered to be reliable, notably Costa Rica and Trinidad and Tobago, the discrepancies in the estimated infant mortality rates were of the order of 15 deaths per thousand live births. By the same token, however, a reasonable concurrence between the two sets of estimates in Panama and the Philippines suggests that the registration system in those two countries may be better than they were hitherto credited with being. 7/

Table 1 presents several measures of mortality for the 29 WFS countries for which estimates are now available. The measures shown are the neo-natal, infant and childhood mortality rates. 8/ Mortality varies widely between countries. Infant mortality rates range from a low of 33 per thousand live births in Panama to a high of 142 per thousand in Nepal. Even the lowest infant mortality rate recorded by the WFS is significantly higher than the rates in developed countries. As a basis of comparison, it may be noted that in the mid-1970s infant mortality rates in Western Europe and North America in no case exceeded 20 per thousand. Similarly, neo-natal mortality in the latter countries was typically of the order of 10 per thousand, as compared with the present estimates, which range between 14 and 80 per thousand live births in the WFS countries. 9/

In low mortality countries child death is dominated by endogenous factors, such as genetic defects, that are likely to prove fatal very soon after birth, while in high mortality countries exogenous causes, such as infectious disease and gastro-intestinal disorders, perhaps related to weaning, prove much more important. The relation between neo-natal, infant and child mortality is thus not independent of the prevailing level of mortality. In general, the lower the mortality level, the greater the concentration of deaths in the first year and, indeed, within the first month of life. This observation is substantiated by figure I, which shows the proportions of under-five deaths attributable, first, to deaths during the neo-natal period and, secondly, to deaths during the first year of life, according to the probability of dying before age 5. Thus, it can be seen that in countries such as Bangladesh and Nepal, where the probability of dying before age 5 exceeds 200 per thousand, neo-natal mortality accounts for one third, and infant mortality for three fifths, of all childhood deaths. In contrast, in Panama and Jamaica, where 95 per cent of babies can be expected to reach their fifth birthday, neo-natal and infant deaths account for, respectively, about two fifths and three quarters of childhood mortality.

TRENDS IN INFANT AND CHILD MORTALITY

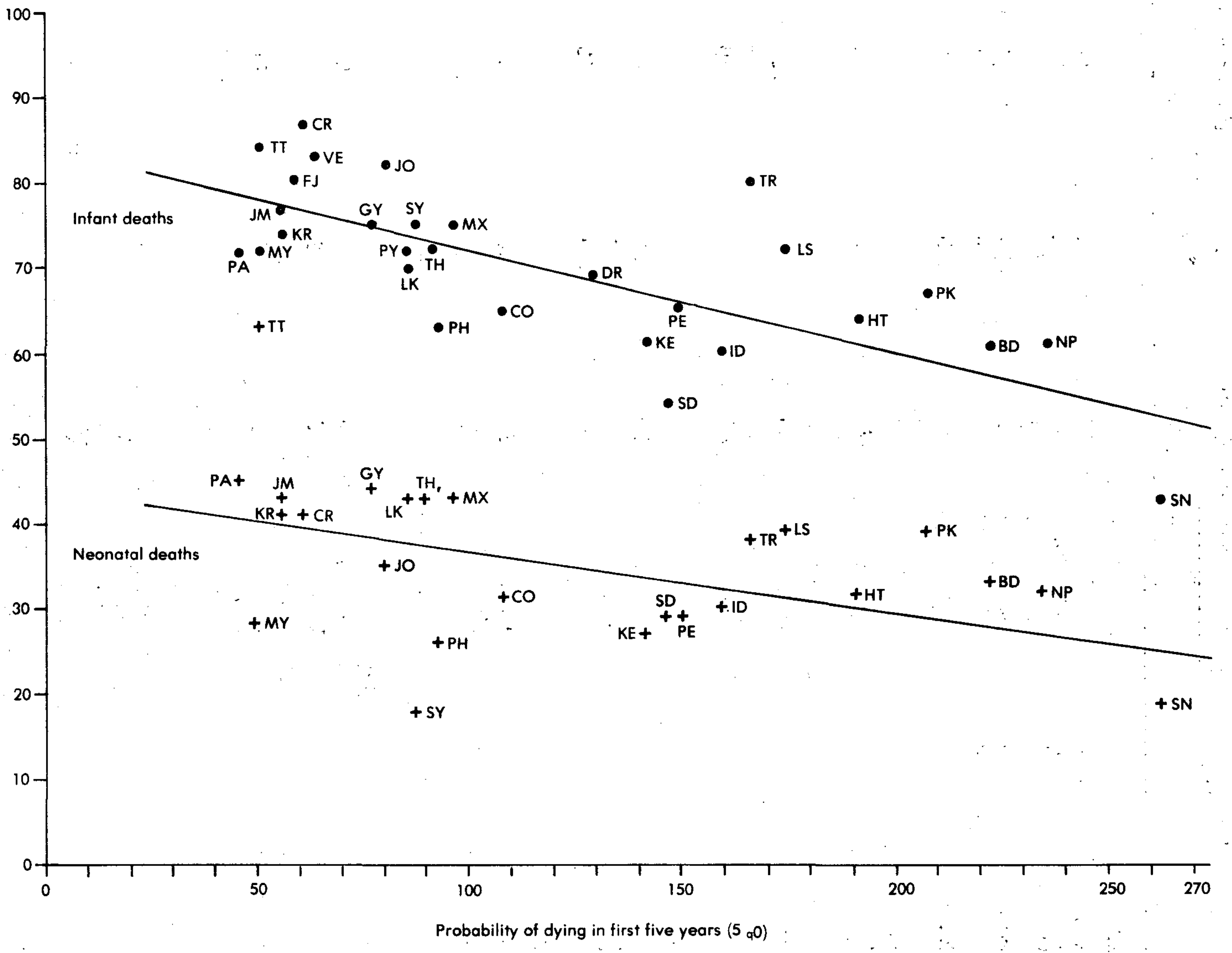
Table 2 presents estimated levels of infant and childhood mortality during the four five-year periods preceding the surveys. Since upper age limits were imposed on the samples, the information on births and deaths is limited to progressively younger mothers as we move back in time. Inasmuch as a child's survival chances are related to maternal age, the resulting truncation will bias the estimates. To lessen this bias, the table is restricted to women aged 20 to 29 at the time of confinement. It should be noted also that the quality of the data is likely to deteriorate as the events of interest become more remote, and we therefore place more reliance on recent estimates than on those based on children born, say, 15 to 19 years before the surveys.

Table 1. Neo-natal, infant and childhood mortality rates (per thousand) for the period 0-4 years before the Survey

Region/Country	Date of Survey	Neonatal	Infant ($_1q_0$)	Childhood ($_5q_0$)
Caribbean				
Trinidad & Tobago	1977	32	43	50
Jamaica	1975-76	24	43	56
Costa Rica	1976	25	53	61
Guyana	1975	34	58	77
Dominican Republic	1975	-	89	129
Haiti	1977	61	123	192
Latin America				
Panama	1975-76	21	33	46
Venezuela	1977	-	53	64
Paraguay	1979	-	61	85
Colombia	1976	34	70	108
Mexico	1976-77	41	72	96
Peru	1977-78	44	97	149
Middle East				
Syria	1978	16	65	87
Jordan	1976	28	66	80
Turkey	1978	63	133	166
South Asia				
Sri Lanka	1975	37	60	86
Bangladesh	1975-76	74	135	222
Pakistan	1975	80	139	207
Nepal	1976	75	142	235
East and South-East Asia				
Malaysia	1974-75	14	36	50
Korea	1974	23	42	56
Philippines	1978	25	58	93
Thailand	1975	39	65	91
Indonesia	1976	47	95	159
Africa				
Sudan	1978-79	42	79	177
Kenya	1977-78	38	87	142
Senegal	1978	50	112	262
Lesotho	1977	68	123	191
Fiji	1974	-	47	59

Source: S. Rutstein, "Infant and child mortality: levels, trends and differentials," *WFS Comparative Studies*, No. 24 (1983), p. 19.

Figure I: Neonatal and infant deaths as proportions of all deaths in the first five years of life according to the probability of dying before age 5



Source: Rutstein, **loc. cit.**

Table 2. Infant and childhood mortality rates (per thousand) for children born to mothers aged 20-20 years according to period prior to the Survey

Region/Country	Date of survey	Infant ($_{1}q_{0}$) Years prior to Survey				Childhood ($_{5}q_{0}$) Years prior to Survey			
		0-4	5-9	10-14	15-19	0-4	5-9	10-14	15-19
Caribbean									
Trinidad & Tobago	1977	33	41	39	54	41	50	46	60
Jamaica	1975-76	39	30	40	79	48	43	54	100
Costa Rica	1976	44	59	81	60	51	76	100	90
Guyana	1975	54	50	56	67	73	63	72	89
Dominican Republic	1975	81	98	105	72	121	136	162	(118)*
Haiti	1977	124	149	157	143	187	234	255	(244)
Latin America									
Panama	1975-76	27	43	39	60	36	56	62	83
Venezuela	1977	45	45	41	45	55	63	58	(78)
Paraguay	1979	52	45	57	43	73	63	78	64
Colombia	1976	57	64	72	84	90	101	117	134
Mexico	1976-77	60	75	81	86	84	109	119	139
Peru	1977-78	89	102	112	123	141	158	193	211
Middle East									
Syria	1978	63	66	80	86	84	89	121	138
Jordan	1976	66	62	76	111	76	85	121	186
Turkey	1978	119	128	146	176	151	176	206	267
South Asia									
Sri Lanka	1975	58	57	59	61	81	81	88	102
Bangladesh	1975-76	117	110	130	140	209	187	205	230
Pakistan	1975	132	128	130	156	203	188	219	252
Nepal	1976	142	149	182	172	233	241	294	293
East and South-East Asia									
Malaysia	1974-75	36	39	51	72	47	52	71	105
Korea	1974	35	51	53	64	51	81	101	114
Philippines	1978	52	54	50	55	85	86	86	91
Thailand	1975	57	77	86	95	83	108	122	138
Indonesia	1976	88	89	113	117	152	163	199	218
Africa									
Sudan	1978-79	67	72	71	49	129	123	140	(142)
Kenya	1977-78	83	88	96	121	135	148	157	193
Senegal	1978	102	115	115	106	251	270	294	268
Lesotho	1977	122	123	139	115	166	177	188	169
Fiji	1974	42	51	53	64	52	56	61	70

Source: Rutstein, loc. cit., p. 23.

* Figures in parenthesis are based on fewer than 500 children.

In general, all countries surveyed show evidence of long-term mortality declines although the extent and timing of the declines vary greatly between countries. The most striking examples of sustained declines in infant and childhood mortality are those in Peru, Turkey and Thailand. In Turkey, for example, the infant mortality rate fell from about 180 to 120 per thousand over the last 20 years, and mortality within the first five years of life plummeted from 270 to 150 during the same period. Other countries that exhibit continuing mortality declines are Colombia, Mexico, Korea and Kenya and, disregarding estimates for the most distant period, Costa Rica, Haiti and the Dominican Republic.

Some countries experienced mortality declines in the past, but children born during the five years preceding the survey do not appear to have been advantaged relative to those born during the previous five-year period. Such countries include Syria, Malaysia and Nepal. In other countries, notably Jordan, Indonesia and Lesotho, infant mortality rates did not vary greatly between the two most recent periods although there were continued gains in the survivorship of children younger than five. Thus, in Indonesia the infant mortality rate remained constant at about 90 per thousand but overall child mortality fell from about 160 to 150 per thousand. In several countries mortality appears to have stabilized in the early 1960s. The clearest example of this is the Philippines, where infant mortality hovered in the low 50s, and childhood mortality in the mid 80s, during the last three five-year periods. Guyana, Venezuela, Sri Lanka, Pakistan and the Sudan might also be included in this group, although some of these countries might have experienced real, albeit slight, gains in childhood survival.

Not all countries fit the general picture of declining infant and child mortality, however, long ago these declines might have occurred. In Paraguay, for example, the infant mortality rate has been fluctuating at around 50 per thousand during the last 20 years. In Bangladesh and Jamaica infant and under-five mortality appears to have risen in recent years after undergoing some earlier decline. While these irregularities may be caused in part by errors in the data and sampling fluctuations, there is reason to believe that in the case of Bangladesh the rise is, in fact, real. 10/

When mortality is high, the predominant causes of post-neo-natal and child mortality can be controlled or even eliminated through what are essentially public health measures, for example mass immunization, better water supplies and improved sanitation. Considerable mortality reduction can be achieved also through education and, in particular, through the dissemination of basic health information, but beyond some point further reduction of infant mortality requires more sophisticated and expensive, perhaps clinical, intervention. One might expect, therefore, that the greatest absolute mortality declines would have occurred in the countries with the highest initial mortality. It is noteworthy that the magnitudes of the mortality declines appear to bear no general relation to the levels prevailing earlier. For example, whereas both Colombia and Indonesia were able to stimulate declines in infant mortality of the order of 30 per thousand, the most recent level for Indonesia (90 per thousand) is still higher than that for Colombia 20 years earlier.

DEMOGRAPHIC FACTORS AFFECTING INFANT AND CHILD MORTALITY

Infant and child mortality is independent of neither the child's nor the mother's demographic characteristics. Four demographic factors have been found to be particularly important predictors of child survival. These are the sex of the child, the age of the mother at the time of confinement, birth order and the multiplicity of the birth. As the importance of these factors for infant and child mortality has been extensively documented in a WFS cross-national study 11/ only a brief summary will be given here.

Death rates tend to be higher for males than for females, and the differences can be expected to be apparent right from birth. In every WFS survey except those in Jordan and Syria, the infant mortality rate for males exceeded that for females, and the magnitudes of the differences ranged as high as 25 deaths per thousand live births. There was no relation between the size of the differences and the actual levels of mortality.

The sex ratio of mortality is more balanced in later childhood and, in general, neither sex enjoyed a notable advantage between the ages of one and five. An important exception was Pakistan, where female death rates at ages 1 and 2 to 5 exceeded male rates by a factor of 50 per cent. The difference reflects, perhaps, a "selective neglect" of female children that persists regardless of the sex composition of families. 12/

The occurrence of a multiple birth is a rare event; indeed, only 1.8 per cent of the half-million or so births captured in the 29 surveys for which processing has been completed were the outcome of such confinements. While the deaths of children born of multiple births cannot greatly affect overall mortality levels, the levels of mortality for these children are staggering. In no country was their infant mortality rate less than 150 per thousand, and in only five countries was it lower than 200 per thousand. Overall, infant mortality rates for multiple births were between two and one half and six times higher than for singletons, and the differences persisted well into childhood.

In countries with reliable vital registration, neo-natal and infant mortality are known to vary according to the mother's age at the time of confinement, regardless of the overall level of risk in the community. The
tion tends to be J- or U-shaped, with mortality high for the children of
thers, relatively low for those in their twenties and then rising
creasi aternal age. 13/ Infant mortality rates for children
ing the surveys generally vary with maternal age.
teen-aged mothers were subject to considerably
rths to mothers aged 20 to 29; in half the 29
screpancies were found to continue into the second
ife.

of minimal risk was 20 to 29 years, and infant death
at the higher maternal ages. No single pattern could
and in a handful of countries, notably Syria, Sri
period of minimal risk occurred between ages 30

and 39. Most countries showed extremely high death rates for the infants of mothers aged 40 and above, and increases in infant mortality at the older maternal ages were found to be more pronounced in countries in which overall mortality levels were low.

In most WFS surveys, birth order also proved to be an important correlate of infant mortality. In high-mortality countries, such as Nepal and Kenya, first-born children were at greater risk of dying during infancy than were their younger siblings, although there was a tendency for risks to increase again at birth orders seven and above. This U-shaped pattern was not observed in all countries. Indeed, in countries in which overall child mortality levels were lower, such as the Philippines and Jamaica, the first-born were the most likely to survive, and thereafter risks of death increased progressively with birth order.

With some modification, those observations hold true for the probability of dying during the second year of life. In virtually every country "toddler" mortality increased with birth order, and only in one country, Senegal, did the risk for first-born one-year-olds exceed that of the second- or third-order births by more than five deaths per thousand. An even simpler relation emerged for mortality between the ages of two and five, with the risks tending to increase monotonically with the order of the birth.

Birth order and maternal age are necessarily related but, in this application, one is not a proxy for the other. Other work has indicated that there is an interaction such that the risk of death to children of mothers of the same age varies with birth order: infants most at risk tend to be high-birth-order children of very young mothers and low-birth-order (in particular, the first-born) children of relatively older mothers. 14/ This interaction may account, at least in part, for the absence of a completely uniform pattern in the relation between risks of child death, on the one hand, and maternal age or birth order, on the other, since age-specific parity distributions, and hence the weighting of births according to birth order, vary between countries. Unfortunately, however, infant and child death rates classified by both maternal age and birth order have not yet been analysed.

SOCIO-ECONOMIC DIFFERENTIALS IN INFANT AND CHILD MORTALITY

The WFS surveys constitute a rich mine of information on socio-economic differentials in infant and child mortality. All surveys included questions on such background characteristics as the respondent's education, current and childhood places of residence and work history as well as the current husband's education, occupation and labour force status. Several surveys a included questions on religion, ethnicity and language for women, and age income and migration for husbands.

A comparative analysis of socio-economic differentials of child among children born 5 to 15 years prior to the surveys has shown th rates between the ages of one and five are generally lower in urb rural areas, and lowest of all in metropolitan centres. 15/ A striking example of such differentials occurs in Peru, where death rates for children aged 1 to 5 years rose from 20 per thousand for those in the capital to 60 per thousand for those in other urban areas, and to nearly 100 per thousand for those in rural areas. An even greater absolute differential was recorded in Senegal, where urban and rural child death rates were, respectively, 116 and 222 per thousand. It is noteworthy also that such differentials tended to be present whatever the underlying mortality level, although, not surprisingly, the lower the underlying level of mortality the smaller the absolute differences in child mortality.

The picture is more complicated if we confine our attention to deaths that occur during the first year of life. In about half of the 22 countries for which detailed comparisons are available, infant mortality (and its principal component, neo-natal mortality) was lowest in metropolitan areas, higher in other urban agglomerations and higher still in rural areas. In other countries, urban-rural differences did exist, but infants in metropolitan centres did not appear to be greatly advantaged in comparison with those living in other urban areas. Such countries include Jordan, Malaysia, Indonesia and Kenya.

In Guyana, infants in urban areas experienced higher mortality than did those in rural areas. In several high-mortality countries, notably Haiti, Bangladesh and the Sudan, infant death rates were lower in urban than in rural areas but children in metropolitan areas were significantly disadvantaged. In Haiti, for example, infant death rates in non-metropolitan urban and rural areas were 90 and 140 respectively, but more than 160 per thousand in metropolitan Port-au-Prince.

In developing countries, mortality is often thought to be higher in rural than in urban areas because of differential standards of living and health conditions in general, and differential availability and access to public health facilities in particular. The variety of urban-rural infant mortality differentials recorded by the WFS surveys does not necessarily counter such arguments since the quality of urban life varies greatly both within and between countries. However, residential differences may subsume other important behavioural determinants of child mortality.

One such factor is parental education. Infant and child mortality are shown according to the mother's years of education in table 3. It should be noted at the outset that comparisons are complicated by the fact that in one country a given number of years of schooling may indicate a woman's membership of a social elite whereas in another country the same duration of schooling may indicate that the woman is relatively disadvantaged. The same observation holds true for young women and older women within any country which has expanded its education system within the life-times of the respondents. It is remarkable, therefore, that in virtually every country shown both infant and child mortality decreases consistently with increasing years of education. For example, infant mortality among women in Costa Rica declines from 119 for those with no schooling to 82 for those with one to three years, to 74 for those with four to six years, and to 42 for those with seven or more years of school attendance. Similarly, mortality between the first and fifth birthdays falls from 47, to 22, to 13, and to 4 deaths per thousand across the same

Table 3. Infant and child mortality rates (per thousand) among children born 5-15 years before the survey, according to mothers' years of education

Region/Country	Infant ($_1q_0$) Years of education				Child ($_4q_1$) Years of education			
	0	1-3	4-6	7+	0	1-3	4-6	7+
Caribbean								
Trinidad & Tobago	(65)*	(99)	54	37	(11)	(19)	7	7
Jamaica	(59)	(54)	56	38	(25)	(26)	20	13
Costa Rica	119	82	74	42	47	22	13	4
Guyana	(61)	(69)	64	59	(24)	(24)	19	15
Dominican Republic	-	-	-	-	77	79	31	(11)
Haiti	151	(126)	(127)	(66)	94	(62)	(94)	(25)
Latin America								
Panama	95	70	39	34	45	24	13	9
Venezuela	-	-	-	-	28	22	12	2
Paraguay	-	-	-	-	42	24	16	8
Colombia	93	88	50	44	60	46	35	6
Mexico	96	90	70	42	65	32	19	8
Peru	153	118	75	53	104	64	26	13
Middle East								
Syria	78	(62)	63	36	29	(14)	14	14
Jordan	82	69	68	57	35	17	19	12
South Asia								
Sri Lanka	74	72	57	53	34	29	25	13
Bangladesh	148	143	138	(119)	92	70	61	(7)
Pakistan	144	(121)	(111)	(92)	80	(29)	(35)	(24)
Nepal	174	(155)	(142)	(120)	114	(75)	(23)	(22)
East and South-East Asia								
Malaysia	50	51	49	17	19	14	10	2
Korea	79	62	50	40	42	35	26	6
Philippines	79	72	60	38	57	51	38	17
Thailand	107	80	81	(33)	46	(30)	30	(5)
Indonesia	121	115	84	59	86	92	66	20
Africa								
Sudan	85	(--------- 56 ---------)			69	(-------- 57 -----------)		
Kenya	112	105	88	64	81	70	46	52
Senegal	130	(68)	(92)	(0)	194	(119)	(26)	(19)
Lesotho	(168)	167	136	141	(75)	65	62	37

Source: J. Hobcraft, P., McDonald and S. Rutstein, "Socio-economic factors in infant and child mortality: a cross-national summary," Paper presented at the Annual Meeting of the Population Association of America, San Diego, California, 1982.

*Figures in parenthesis are based on fewer than 500 children.

durations of schooling. Overall, the ratios of infant death rates for the highest and lowest educational groups range from about one third in Peru and Malaysia to two thirds in Sri Lanka and Nepal.

Since the better-educated tend to be concentrated in the urban areas, we would expect the effect of education on infant and child mortality to play an unseen part in maintaining urban-rural differentials, and in many cases this is in fact true. For example, in Sri Lanka, where mortality now appears to be stabilizing, a small but persistent urban-rural differential in childhood mortality disappeared once maternal education was controlled. 16/ In Kenya, where mortality declines are continuing, urbanization and education appear to act independently to depress infant mortality for younger women, but among older women urbanization has no effect independent of education. 17/

The importance of parental education in reducing mortality within the first two years of life has been documented in a study of 10 WFS countries as diverse as Jamaica, Bangladesh and Peru. The mother's attainment of primary schooling was found to have a significant impact on child survival, but more critical than the step from illiteracy to primary education was that from primary to secondary schooling. In most cases the father's education also had a bearing on early childhood mortality quite distinct from the effects of occupation and mother's education, but overall its effect appeared to have been smaller than that of mother's education. There were also suggestions that the impact of parental education may have been greater than that of income factors and access to health facilities combined. 18/

An analysis extending to 28 WFS surveys confirmed the overall association between parental education and early child mortality, and found that in general it extended into the first five years of life. The result of this study indicated not only that earlier analyses might have under-emphasized the importance of paternal education for infant mortality but also that the father's educational level was often the strongest predictor of child survival beyond age 1. The relative contribution of the parents' characteristics was found also to differ greatly between countries. For example, while mother's education emerged as an important determinant of child survival in most Latin American surveys, in tropical Africa and parts of South-East Asia, where there are relatively few educated women, the role of husband's education and occupation was particularly strong. This study stressed, in addition, the interplay of such characteristics as education, income, occupation and work status: in some sense the better-educated and wealthier can be expected to be better nourished and to have better housing, and to be more likely both to recognize illness requiring medical intervention and to have the wherewithal to afford medical attention. 19/

The type of marital union is also a factor to be considered when examining childhood mortality. In those, mostly Caribbean, surveys in which legal marriages were distinguished from consensual unions, children born within formal marriages generally faced lower risks of dying than did other children. In addition, children born to women not in a union at the time of confinement also experienced higher than average mortality rates.

A number of studies based on WFS surveys have signalled the importance of the characteristics of households, as opposed to the characteristics of individuals, for child survival. Thus, in the Philippines the availability of sanitation and electricity proved to be correlates of child mortality even after controlling for such things as birth order, maternal age and education. 20/ In Panama, the characteristics of the mother were found to be the most important determinants of neo-natal mortality but housing conditions, in particular the type of water supply and sewage disposal, had an importance almost equal to that of the mother's characteristics in determining post-neo-natal mortality. 21/ Access to toilet facilities also showed a clear relationship with early child survival in Sri Lanka and Mexico, but in neither country did the availability of piped water appear to have a bearing on mortality within the first five years of life. 22/

COMMUNITY CHARACTERISTICS

In many countries, infant and child mortality varies greatly between subnational regions. In Peru, for example, region of residence was the single most important determinant of child death after mother's educational level. 23/ Similarly, region of residence emerged as a significant determinant of child mortality in Pakistan, Indonesia and the Philippines, even after controlling for the effects of both parental and household characteristics. 24/

Sixteen countries incorporated a "community variable" module in their surveys so as to allow for the study of the effects of aggregate-level characteristics on fertility and mortality. Each module contained questions on the availability of health facilities, such as hospitals, family planning clinics, doctors and midwives. Several countries included questions on maternal and child health care, and most included questions on community amenities, such as public sanitation and water supplies. One country, Malaysia, also included a series of questions on endemic diseases. In light of the difficulties in defining communities in towns and cities the use of community-level questionnaires was generally confined to rural areas.

Attempts to explain variation in aggregate fertility measures by reference to community characteristics have been disappointing. 25/ Studies linking community and individual level variables to child mortality, although few in number, have proved more promising. For example, preliminary work on the Philippines indicates that among better-educated mothers neo-natal mortality, and among self-employed fathers post-neo-natal mortality, is significantly reduced if there is a trained midwife in the area. That the effect of having access to medical personnel emerges only in interaction with parental characteristics suggests, however, that proximity to medical services is not in itself sufficient to reduce infant mortality. 26/

A workshop and seminar was convened in London in 1983 to explore relations between infant and child mortality and community characteristics in several developing countries. The workshop will conclude with a seminar in June 1983.

Surveys in five Latin American countries have collected information on maternal and child health care, and an analysis of these data is now under way. Apart from assessing the coverage of maternal and child health services in the five countries, the study aims at examining the relationship between the use of health services, infant-feeding practices and mortality.

INFANT MORTALITY AND FERTILITY

One of the most frequently observed associations in demography is that between fertility and mortality. In general, countries with high fertility are found also to have high mortality, and countries with low fertility to have low mortality. At the aggregate level this association is often thought to reflect common antecedent conditions, such as levels of social and economic development, health conditions and general standards of living. A body of research suggests, however, that fertility and mortality, particularly infant and child mortality, are causally conjoined at the individual level.

Two explanations have been advanced for how the death of a child may influence its mother's subsequent childbearing. The first is a "replacement effect", whereby parents consciously seek to replace a child that has died. The second is a biological effect, whereby the death of an infant truncates the period of post-partum amenorrhoea, lactation or sexual abstinence so that, in the absence of birth control, a woman is exposed to the risk of another conception much sooner than would otherwise have been the case. 27/

An analysis of Colombian WFS data which attempted to disaggregate the relationship between infant mortality and fertility reported that both the biological and the replacement effects were operating. In the former case, examining the last closed birth intervals of non-contraceptors, the death of a child within the first six months of life was associated with an average reduction in the birth interval of 10 calendar months. In the latter case, examining the numbers of children ever born and still surviving to contraceptors or prospective contraceptors whose last pregnancy was reportedly wanted, the replacement of dead children was estimated to have been almost complete. Since infant mortality is relatively low in Colombia and few women use or plan to use contraception, the combined impact of these two effects on fertility was small. 28/

The existence of a biological effect has been demonstrated also in Pakistan through comparisons of the length of the interval between births when the earlier child had died and when it had survived. There was no evidence of the replacement of dead children. Although the death of an infant once again reduced the birth interval by as much as 10 months, the overall impact of infant mortality on fertility was estimated to have been minimal. 29/

A World Bank study based on 25 WFS surveys found that in nearly half the countries birth intervals were significantly shorter if an infant had died than if it had survived, a finding that was attributed to behavioural as well as biological effects to the extent that mortality experience affects contraceptive use in the interval. The study also reported that couples that had lost an infant were generally more likely to bear additional children than those that had not, and the strength of this parity effect on subsequent childbearing was stronger than the birth interval effects. 30/

The likelihood of a child's surviving is known to be related to the length of the interval leading up to its birth. The relation is such that infants born after a very short birth interval, say less than 18 months, experience elevated mortality risks, especially within the first month of life. Birth interval effects are not entirely independent of those of maternal age and birth order in the sense that, for example, the births of a young high-parity mother are of necessity closely spaced. Indeed, there is some argument that the length of the interval between siblings' births may in fact be a more important determinant of early child death than the order of the birth. 31/

Infant and child mortality rates for second- and higher-order births classified according to the time since the previous birth are shown for 29 WFS surveys in table 4. Countries are ranked in decreasing order of magnitude of infant mortality of children born two to three years after their immediately older brothers and sisters. Without exception, infants born within two years of an older sibling were subject to higher death rates than were those born two to three years after the previous birth. In several countries, notably Lesotho, Turkey and Bangladesh, the absolute difference between the rates approaches 90 per thousand, and even in countries in which overall mortality levels are low, such as Panama, Malaysia and Jamaica, the difference is seldom less than 20 deaths per thousand live births. The relative differences in mortality are reduce if the older sibling survived for at least two years or until the birth of the reference child, but in the majority of countries it still exceeds 40 per cent. This is so whatever the underlying mortality level. For example, given the survival of the older sibling, the death rate in Nepal among infants born within two years of the previous birth was about 180 per thousand as opposed to a rate of 130 per thousand for those born two to three years after the previous confinement. Comparable figures for Trinidad and Tobago are about 40 and 30 per thousand.

It has been suggested that from the point of view of the health of both the mother and unborn child, the optimal birth interval is of the order of 18 months to three years. 32/ These findings, however, pertain largely to developed countries, in which breast feeding durations are short and general nutritional and health standards are high. The optimal birth interval in developing countries may be somewhat longer. These observations accord well with the findings of table 4 that in medium-to-high-mortality countries by far the lowest death rates are recorded among infants born after intervals of four or more years. In most of these countries the risk associated with the longest birth intervals is 15 to 30 per thousand lower than that associated with intervals of two to three years' duration; in Nepal, the difference is as much as 60 per thousand, showing a relative reduction of nearly 50 per cent. It is only in countries where the death rates for the members of the reference group fall below 50 per thousand that the advantage accruing to children born after the longest intervals disappears.

Table 4. Infant and toddler mortality rates (per thousand) for children born 0-9 years before the survey, according to length of previous birth interval

Country	Infant $(_1q_0)$				Toddler $(_1q_1)$			
	Less than 2 years All	Less than 2 years Surviving**	2-3 yrs	4 + years	Less than 2 years All	Less than 2 years Surviving**	2-3 yrs	4 + yrs
Nepal	200	182	131	71	71	68	49	36
Lesotho	202	(160)*	114	89	40	(37)	27	28
Haiti	187	160	112	91	34	34	21	(35)
Senegal	137	105	105	80	68	56	82	44
Pakistan	183	152	103	71	42	40	34	17
Turkey	183	159	95	76	47	48	21	8
Bangladesh	185	161	89	58	42	44	28	10
Peru	137	122	87	55	45	43	31	19
Indonesia	138	116	77	56	45	43	29	11
Dominican Republic	105	88	75	(60)	34	31	21	(18)
Kenya	117	97	67	59	38	35	27	14
Sudan	98	79	60	37	37	35	26	18
Mexico	88	77	54	64	21	20	14	9
Costa Rica	84	74	54	42	11	10	8	6
Sri Lanka	71	63	54	44	11	12	8	9
Colombia	82	72	53	38	23	22	16	17
Thailand	109	96	52	42	16	15	8	6
Philippines	72	68	45	54	20	19	15	16
Paraguay	71	62	45	55	17	17	14	11
Guyana	69	57	43	44	12	12	9	2
Korea	70	53	40	41	17	16	9	9
Syria	90	82	37	23	17	17	9	6
Fiji	58	56	36	41	5	5	5	5
Jordan	87	78	36	38	17	17	9	1
Venezuela	63	57	35	50	8	8	5	(6)
Panama	52	47	33	34	8	8	7	7
Malaysia	44	39	32	30	6	6	8	6
Jamaica	56	50	30	27	10	7	4	8
Trinidad & Tobago	53	42	28	36	6	6	5	2

Source: Rutstein, loc. cit., p. 39.

* Figure in parenthesis are based on fewer than 500 children.

** Older sibling survived at least two years or until the birth of the reference child.

The right-hand panel of table 4 shows that in most countries the influence of the length of the previous birth interval on a child's survival chances extends into the second year of life. This is most clear in those cases where toddler mortality rates are of the order of 30 per thousand and above. In Nepal, for example, the risk of death for children aged 1 year declines from about 70, to 50, to 40 according to whether the reference child was born less than two years, two to three years or four or more years after the immediately preceding confinement, while corresponding death rates for one-year olds in Turkey are approximately 50, 20 and 10 per thousand. Unlike death rates, however, mortality among toddlers born within two years of the last birth appears to be largely independent of the survival status of the older sibling. In a handful of countries, especially high-mortality countries such as Pakistan, Turkey and Bangladesh, substantial birth-interval effects were evident even among death rates for children aged 3 to 5 years. 33/

The deleterious effects of short birth intervals on mortality early in life can be explained in part by the "maternal depletion syndrome", whereby one pregnancy coming too soon after the previous confinement leaves the mother little time to recover her health, especially if the child is breast-fed for a long time or is still unweaned when the next child is conceived. Indeed, a continuous cycle of pregnancy and lactation leads to progressively higher risks of low-birth-weight babies with heightened chances of death. 34/ The effects of maternal depletion may be exacerbated by competition between siblings, since the attention and resources the mother is able to devote to two children very close in age may be insufficient to ensure their survival.

Nevertheless, an analysis based on the Pakistan Fertility Study showed that elevated risks of infant and child death could not be attributed entirely to competition between closely spaced siblings since the previous birth interval was still strongly related to mortality if the older sibling had died. Moreover, this was true even after controlling for birth order and maternal age. 35/ A recent comparative analysis of 26 WFS surveys suggests, however, that both competition and depletion play a role: when children are born in rapid succession both the younger and the older child suffer. 36/

ADULT MORTALITY

WFS did not set out systematically to collect information on adult mortality, and in comparison with the detailed information on infant and child mortality that can be obtained from maternity histories, the information available on adult mortality is indeed scanty. Nevertheless, all individual surveys collected complete marital histories from the respondents, from which it is possible, at least in principle, to estimate adult male mortality from widowhood rates. More importantly, many countries included in their household surveys questions on the deaths of household members during the preceding 12 or 24 months, and some included questions on orphanhood, widowhood and sibling survival. The responses to the first of these allow the direct estimation of current adult mortality levels; while all the items can be used to obtain alternative, indirect estimates of levels and trends in mortality. 37/

The analytic potential of the adult mortality data is lower than that of infant and child deaths. The study of differentials is hampered because the background characteristics available pertain in general to surviving household members rather than to the people at risk of dying, and because the assumptions underlying the estimation techniques may be violated to different extents within subpopulations. Despite such limitations, for many countries, particularly those African countries that have only recently been surveyed, the WFS data can be expected to provide the first comprehensive set of mortality estimates for adults.

DISCUSSION

A survey is not a complete substitute for a well-constructed vital registration system in the study of mortality. The experience of the World Fertility Survey has nevertheless shown the value of the survey approach. Although the estimates of mortality cannot be expected to be as precise as those derived from accurate vital registration, the maternity histories yield a wide range of information not only on levels but also on trends, determinants and correlates of early childhood mortality in each of the participating countries. Moreover, the additional cost of incorporating mortality questions in surveys designed primarily to measure fertility is small.

WFS surveys show that in some countries declines in infant and child mortality have been continuing, and sometimes dramatic, while in others the declines appear to be faltering or even reversing. The recent course of childhood mortality bears no general relation to the mortality levels prevailing one or two decades before the surveys. WFS estimates thus reinforce the disquiet that the post-war era of mortality decline may be coming to an end. 38/

In many developing countries, mortality reductions were achieved relatively easily and cheaply through the initiation of massive public health programmes that did not require for their success lasting changes in the standards of living of the majority of the population. Notwithstanding the past success of these programmes, poor nutrition and contagious and parasitic diseases remain major killers of infants and young children in many of the poorest areas of the world. 39/ The expansion of primary health care services can be expected to contain some of the endemic causes of child death, but it is doubtful that public health measures in themselves can sustain the momentum of mortality decline. Indeed, recent commentators, noting that a general deceleration in mortality reduction in South and East Asia has paralleled a general slowing of economic growth, have argued that the provision of medical technology offers only limited potential in the absence of broad social and economic progress; and that in the long term the reduction of inequalities in educational and employment opportunities will have by far the greatest impact on mortality and morbidity. 40/

The evidence available from WFS on health-related matters is fragmentary, but in the main suggests that an automatic advantage is not necessarily conferred by having access to, say, piped water or medical personnel. Rather, the impact of modern facilities appears to be greatest if in some sense the parents are already moving away from traditional modes of behaviour. In Sri Lanka and Mexico, for example, the availability of sanitation was associated with relatively low childhood mortality, but the most important determinant of child survival was parental education. In neither country did the quality of the water supply appear to have an effect. In the Philippines the benefits associated with modern health care were highly dependent on such parental attributes as the mother's education. It may not be fortuitous that in such cases a key explanatory variable is education, as, indeed, in virtually every WFS survey parental education proved to be closely related to the level of infant and child mortality. 41/

The finding of a universal relationship between the lengths of birth intervals and infant, and even child, survival delineates one important area that has often been neglected in developing countries, and one that may be susceptible to programmatic intervention through the integration of family planning and maternal and child health services. Family planning has often merely meant family limitation, and the health and well-being of mothers and children have been largely ignored. Family planning programmes should aim at improving the health of both mothers and children by encouraging and assisting women to space their pregnancies. If women can be successfully encouraged to extend the period between pregnancies, not only fertility but also infant and child mortality can be expected to decline. The increased assurance of child survival could even provide one of the pre-conditions for further reductions in fertility.

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E. Mortality trends in the industrialized countries*

Jean Bourgeois-Pichat**

Almost 17 years ago, the periodical Population published an article 1/ under the signature of the author of the present study, describing a quick method for deriving an estimate of expectation of life at birth from the crude death rate.

METHOD OF ESTIMATING EXPECTATION OF LIFE AT BIRTH

Summary of the proposed method

The proposed method can be summarized as follows: the crude death rate is known to be dependent not only on the health of the population but also on its age structure, c(a). Given equal health, the crude death rate of a young population is lower than that of an old population. If we measure health by expectation of life at birth, e_o, we write that:

$$m = f[e^o, c(a)],$$

but that means also that expectation of life at birth, e^o, is a function of the crude death rate and age structure:

$$e^o = F[m, c(a)] \qquad (1).$$

The function c(a) can take several forms, depending on the accuracy of the data available. They may be structured by single year of age, in which case c(a) is represented by a hundred or so coefficients. They may be structured by five-year age groups, and the 100 coefficients are then reduced to about 20. But even further simplification is possible, by using only two broad age groups; in this case c(a) is reduced to a single coefficient. 2/ We shall take this latter case, and represent by V the proportion of persons aged 65 and over.

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* The "industrialized countries" are the 37 countries designated as "the more developed countries" in the joint study by the United Nations and the World Health Organization, Levels and Trends of Mortality since 1950 (United Nations publication, Sales No. E.81.XIII.3).

** Chairman, Committee for International Co-operation in National Research in Demography. The original version of this paper (IESA/P/ICP.1984/EG.IV/14) appeared in French.

Observation then shows that equation (1) can be written:

$$e^o = ak(V)m + b \qquad (2),$$

in which a and b are constants and k(V) is a function of the proportion of old people; that function is defined below.

Let us imagine that for a given period we have observations on mortality in a large number of populations - for example, observations of mortality in the 95 departments of France. Let us choose one standard population, such as the average population of France during the period considered. For each population we compute the standardized rate m_c. The function k(V) equals m_c/m. This is a function determined empirically as follows: On a graph, m/V is shown on the abscissa and the ratio m_c/m on the ordinate. A cluster of 95 points is produced. Observation shows that a curve can be drawn that fits this cluster very well. It is that curve that constitutes the function k(V).

We then see that equation (2) is written $e^o = am_c + b$, proving that a and b are the linear regression coefficients of e^o on m_c. That was the principle of the method described in 1966. It was very simple to apply once the function k(V) and the linear regression of e^o on m_c had been determined. The calculation was carried out in three stages. Assume that in a given year:

(a) The crude death rate, m, and the proportion V of persons aged 65 and over are known. Opposite V on the curve k(V), the value of the ratio k was read off;
(b) Multiplying m by k gave m_c;
(c) e^o was read off opposite m_c on the linear regression of e^o on m_c.

The crude death rate is a datum which becomes known very quickly. In most developed countries, for instance, the 1981 rate was known during the year 1982. The proportion of persons aged 65 and over, V, is known from censuses and intercensal estimates. It is a quantity that varies slowly and can be interpolated and extrapolated with a good margin of safety. In 1982, for example, it was possible to estimate V quite accurately for most countries of the world. Once the crude death rate is know, therefore, expectation of life at birth can be calculated.

Refinement of the method

At the end of the 1966 article it was pointed out that there was one other important indicator of mortality that was available very early: the infant mortality rate. It is, in fact, available for most countries at the same time as the crude death rate. We commented at that time that the method, the principle of which has been outlined above, did not utilize that datum on infant mortality and suggested that it should be analysed by separating mortality before the first birthday from mortality at age 1 and over. That will be done below.

Are earlier considerations on overall mortality still valid if the analysis is confined to mortality at age 1 and over? We shall use the following notations: m^1 will be the crude death rate at age 1 and over, m_c^1 the standardized death rate at age 1 and over, e^1 expectation of life at age 1, and m_i infant mortality.

The first thing to do is to see how to move from m and m_c to m^1 and m_c^1 and from e^1 to e^o. For a given year, let B be annual births, D annual deaths and P the mean population for that year.

Deaths at age 1 and over are equal to $D-Bm_i$ and the population aged 1 and over is equal to $P-(B-Bm_i)$. We then get the following expression: 3/

$$m^1 = \frac{D - Bm_i}{P - (D-Bm_i)} = \frac{\frac{D}{P} - \frac{Bm_i}{P}}{1 - (\frac{B}{P} - \frac{Bmi}{P})} = \frac{m - bm_i}{1 - b + bm_i},$$

where b is the crude birth rate. This is the first time it has appeared in our equations but that raises no problem because it is a figure that becomes available at the same time as the crude death rate. In any event, bm_i before b can be ignored, the end result being:

$$m^1 = \frac{m - bm_i}{1 - b} \qquad (3)$$

The same relation applies to the standardized rate at age 1 and over; it suffices to replace the crude birth rate, b, by the crude birth of the standard population chosen, giving:

$$m_c^1 = \frac{m_c - b_c m_i}{1 - b_c} \qquad (4)$$

The movement from e^1 to e^o will be performed as follows: let p(a) be the survivorship function at age a. We can write:

$$e^o = \frac{1 + P(1)}{2} + e^1 P(1) = \frac{1 + 1 - m}{2} + e^1 (1 - m_i)$$

$$e^o = e^1 + 1 - m_i(1/2 + e^1)$$

We can ignore 1/2 before e^1, ending up with the following very simple formula:

$$e^o = e^1 + 1 - m_i e^1 \qquad (5).$$

We shall use the regional demographic data published in France by the Institut National de la statistique et des études économiques (INSEE) 4/ for the period 1974-1976. For each of the 95 departments of France and for 52 urban centres the following information is available:

1. Crude death rate (m)
2. Crude birth rate (b)
3. Infant mortality rate (m_i)
4. Proportion of persons aged 65 and over (V)
5. Expectation of life at birth (e^o and at age 1(e^1)
6. Standardized mortality rate (m_c) computed for all deaths on the basis of a standard population; namely, the mean population of France during the period considered.

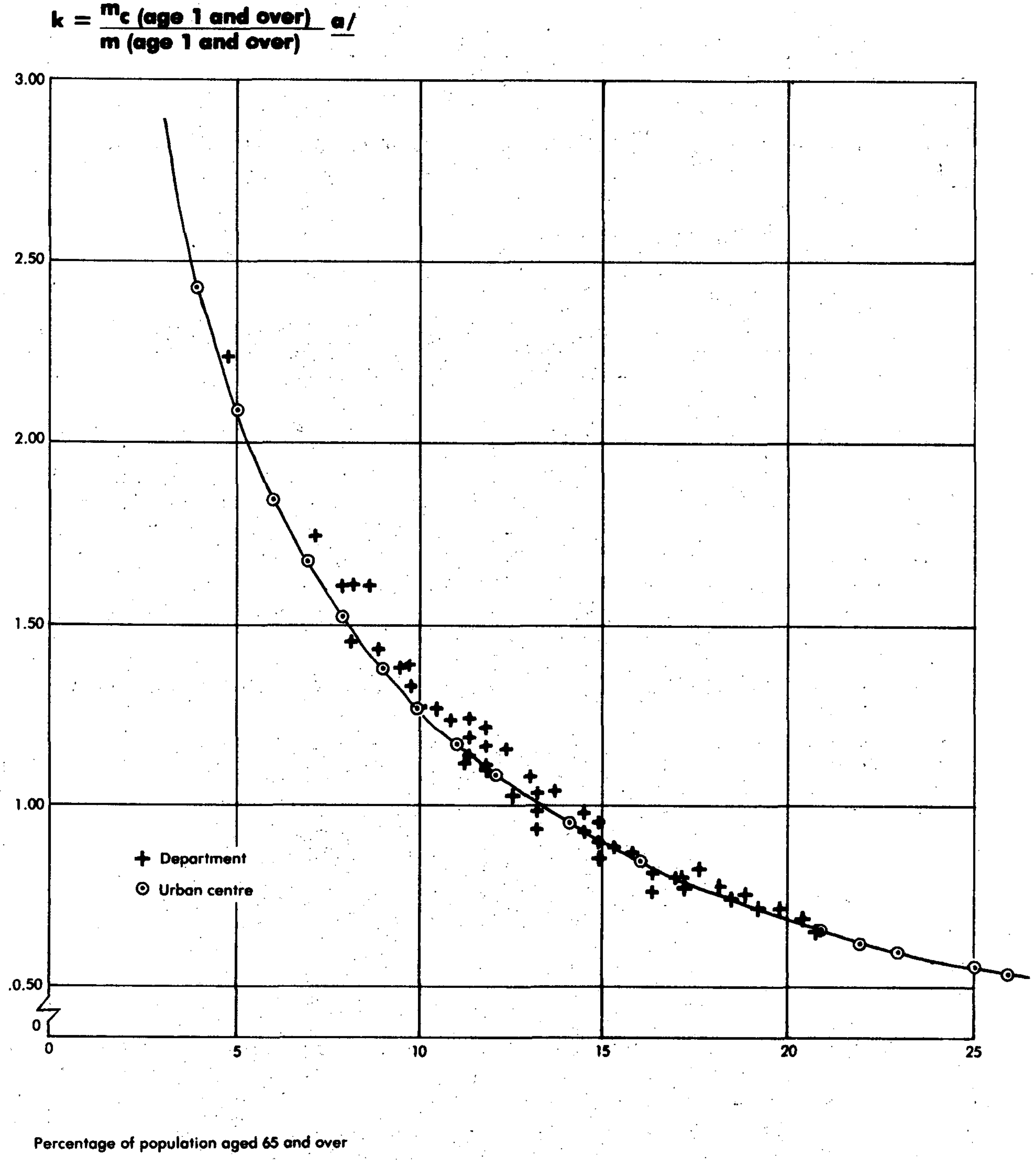
Using expressions (3), (4) and (5);

m^1 and m_c^1 and $k = \frac{m_c^1}{m^1}$ can be computed very easily.

Verification of the proposed model

On the horizontal axis of a graph we show, for each of the 95 departments and 52 urban centres, the proportion, V, of persons aged 65 and over, and on the vertical axis the ratio $k = \frac{m_c^1}{m^1}$. The result is shown in figure I.

Figure I. Relationship between the percentage of persons aged 65 and over and the ratio $k = \frac{\text{standardized rate (age 1 and over)}}{\text{crude death rate (age 1 and over)}}$**, France, 1975**



Source: Based on data in: Michel de Saboulin, "Données de démographie régionale, 1975", No. 388 in Collections de l'INSEE, Series D, No. 82, Démographie et emploi (August 1981).

a/ m = crude death rate: m_c = standardized rate.

It will be seen that a freehand curve can be fitted without major distortion to the cluster of points on the graph; the values from the curve are shown in table 1.

We can now turn to the linear regression equation for e^1 on m_c^1. That is the purpose of figure II. Calculation by the least-squares method gives the equation for the regression line:

$$e^1 = -1.1163\ m_c^1 + 84.655 \qquad (6),$$

in which m_c^1 is expressed per thousand and e^1 in years. Values of this regression line are shown in table 2. The final result is the following expression:

$$e^1 = -1.1163\ k(V)m^1 + 84.655.$$

The analysis which we performed in 1966 of mortality at all ages is therefore also valid if it is combined with mortality at age 1 and over.

Figures I and II are examples of what are sometimes called statistical links between two variables. This means that knowledge of one of the two variables does not lead to full knowledge of the other, which is known only imprecisely, the degree of imprecision being measured by the density of the cluster of points around the fitted curve. But it must be understood that the density of the cluster is not the product of random variations. If, for example, in figure II - the linear regression of e^1 on m_c^1 - one French department lies above the regression line during the period around 1975, it will also lie above it in another period. The upward deviation is not the result of chance. On the contrary, it reflects very specific characteristics of that department - a whole series of characteristics which are unknown to us and are hard to ascertain because they are so numerous. It is this non-random character of deviations that will enable us to apply tables 1 and 2 to populations other than that of the 95 French departments and 52 urban centres which were used in preparing them.

Some applications of the method

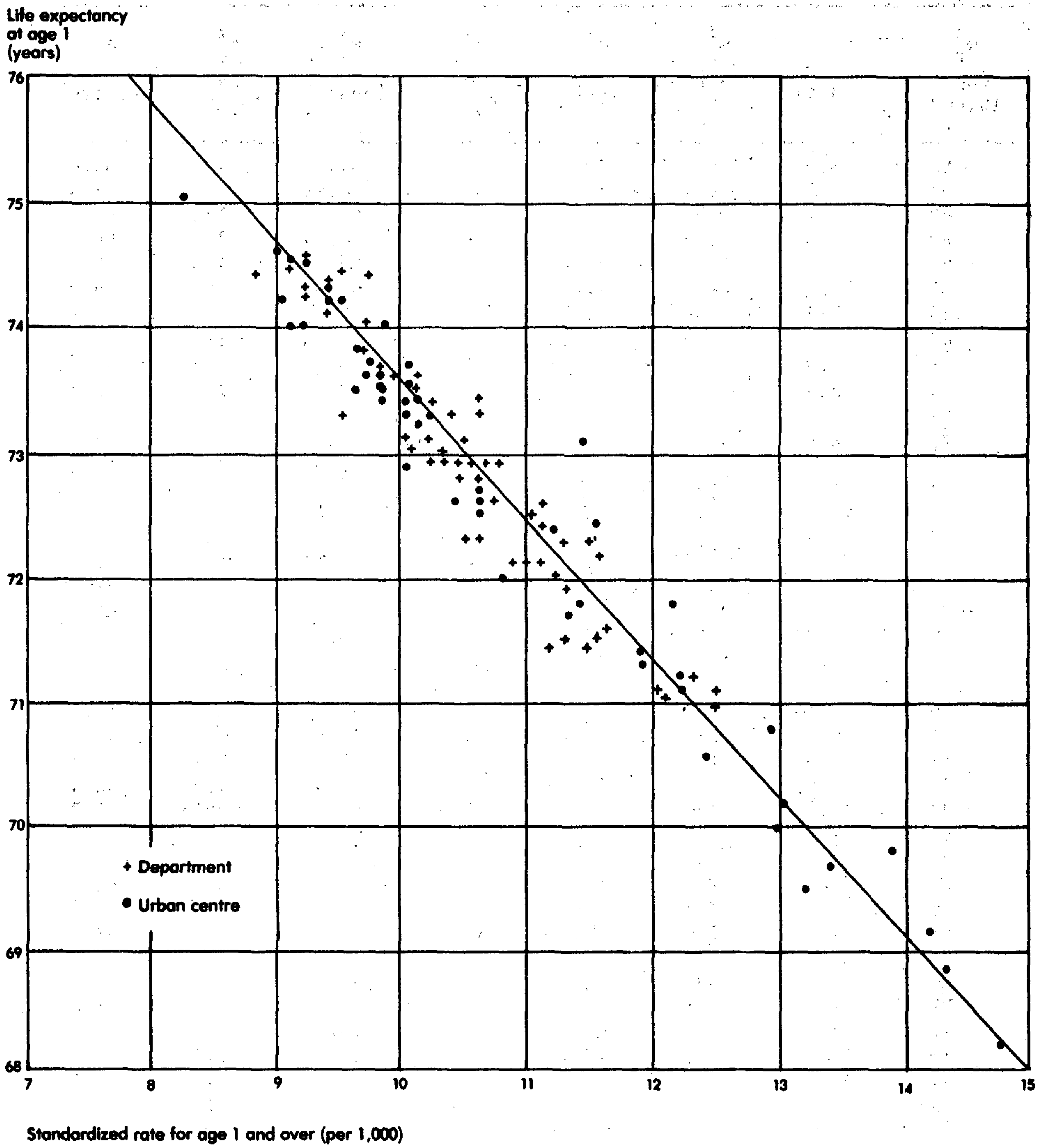
Japan

The method of estimation available to us will now be applied to the study of mortality trends in industrialized countries from 1960 to 1981. The best way of understanding the principle of application of this method is to apply it to a specific example. That we can do by using table 3, which relates to Japan.

Table 1. Values of the ratio $k = \frac{m_c^1}{m^1}$ as a function of the proportion, V, of persons aged 65 or over (fitted curve in figure 1)

V o/oo	k	V o/oo	k	V o/oo	k	V o/oo	k	V o/oo	k	V o/oo	k
30	2.900	70	1.680	110	1.175	150	0.900	190	0.730	230	0.615
31	2.850	71	1.660	111	1.167	151	0.895	191	0.726	231	0.613
32	2.800	72	1.640	112	1.159	152	0.890	192	0.723	232	0.611
33	2.740	73	1.620	113	1.151	153	0.885	193	0.719	233	0.609
34	2.690	74	1.610	114	1.143	154	0.880	194	0.716	234	0.607
35	2.640	75	1.595	115	1.135	155	0.875	195	0.712	235	0.605
36	2.600	76	1.580	116	1.127	156	0.870	196	0.709	236	0.603
37	2.560	77	2.565	117	1.119	157	0.865	197	0.705	237	0.601
38	2.510	78	1.550	118	1.111	158	0.860	198	0.702	238	0.599
39	2.470	79	1.535	119	1.103	159	0.855	199	0.698	239	0.597
40	2.430	80	1.520	120	1.095	160	0.850	200	0.695	240	0.595
41	2.390	81	1.505	121	1.088	161	0.845	201	0.692	241	0.593
42	2.360	82	1.490	122	1.081	162	0.840	202	0.689	242	0.591
43	2.320	83	1.475	123	1.074	163	0.835	203	0.686	243	0.589
44	2.280	84	1.460	124	1.067	164	0.830	204	0.683	244	0.587
45	2.250	85	1.445	125	1.060	165	0.825	205	0.680	245	0.585
46	2.220	86	1.431	126	1.053	166	0.821	206	0.677	246	0.583
47	2.190	87	1.417	127	1.046	167	0.817	207	0.674	247	0.581
48	2.160	88	1.403	128	1.039	168	0.813	208	0.671	248	0.579
49	2.130	89	1.389	129	1.032	169	0.809	209	0.668	249	0.577
50	2.100	90	1.375	130	1.025	170	0.805	210	0.665	250	0.575
51	2.070	91	1.362	131	1.018	171	0.801	211	0.662	251	0.574
52	2.050	92	1.350	132	1.011	172	0.797	212	0.660	252	0.573
53	2.020	93	1.339	133	1.004	173	0.793	213	0.657	253	0.572
54	1.990	94	1.328	134	0.997	174	0.789	214	0.655	254	0.571
55	1.970	95	1.318	135	0.990	175	0.785	215	0.652	255	0.570
56	1.950	96	1.306	136	0.984	176	0.781	216	0.650	256	0.569
57	1.930	97	1.294	137	0.978	177	0.777	217	0.647	257	0.568
58	1.900	98	1.282	138	0.972	178	0.773	218	0.645	258	0.567
59	1.870	99	1.271	139	0.966	179	0.769	219	0.642	259	0.566
60	1.850	100	1.260	140	0.960	180	0.765	220	0.640	260	0.565
61	1.830	101	1.251	141	0.956	181	0.761	221	0.637	261	0.564
62	1.810	102	1.242	142	0.948	182	0.757	222	0.635	262	0.563
63	1.790	103	1.233	143	0.942	183	0.753	223	0.632	263	0.562
64	1.770	104	1.224	144	0.936	184	0.749	224	0.630	264	0.561
65	1.750	105	1.215	145	0.930	185	0.745	225	0.627	265	0.560
66	1.740	106	1.207	146	0.924	186	0.742	226	0.625	266	0.559
67	1.720	107	1.199	147	0.918	187	0.739	227	0.622	267	0.558
68	1.710	108	1.191	148	0.912	188	0.736	228	0.620	268	0.557
69	1.690	109	1.183	149	0.906	189	0.733	229	0.617	269	0.556

Figure II. Relationship between the standardized mortality rate for age 1 and over and life expectancy at age 1, France, 1975 (Regression line for the equation calculated on the crosses a)



Source: Based on data in Michel de Saboulin, "Données de démographie régionale 1975", No. 388 in **Collections de l'INSEE**, Series D, No. 82, **Démographie et emploi** (August, 1981).

a/ The equation is $e_o^1 = -1,1163\ m_c(1+) + 84,655$, where $m_c\ (1+)$ is the standardized mortality rate per 1,000 at age 1 and over and e_o^1 is life expectancy at age 1, in years.

Table 2. Relationship between the death rate at age 1 and over (m_c^1) and life expectancy at age 1 (regression line in figure II)

m_c^1 (per 10,000)	e^1 (years)	m_c^1 (per 10,000)	e^1 (years)	m_c^1 (per 10,000)	e^1 (years)	m_c^1 (per 10,000)	e^1 (years)
60	78.0	100	73.5	140	69.0	180	64.6
61	77.8	101	73.4	141	68.9	181	64.5
62	77.7	102	73.2	142	68.8	182	64.3
63	77.6	103	73.1	143	68.7	183	64.2
64	77.5	104	73.0	144	68.6	184	64.1
65	77.4	105	72.9	145	68.5	185	64.0
66	77.3	106	72.8	146	68.4	186	63.9
67	77.2	107	72.7	147	68.2	187	63.8
68	77.0	108	72.6	148	68.1	188	63.7
69	76.9	109	72.5	149	68.0	189	63.6
70	76.8	110	72.4	150	67.9	190	63.4
71	76.7	111	72.2	151	67.8	191	63.3
72	76.6	112	72.1	152	67.7	192	63.2
73	76.5	113	72.0	153	67.6	193	63.1
74	76.4	114	71.9	154	67.5	194	63.0
75	76.3	115	71.8	155	67.4	195	62.9
76	76.1	116	71.7	156	67.2	196	62.8
77	76.0	117	71.6	157	67.1	197	62.7
78	75.9	118	71.5	158	67.0	198	62.6
79	75.8	119	71.3	159	66.9	199	62.4
80	75.7	120	71.2	160	66.8	200	62.3
81	75.6	121	71.1	161	66.7	201	62.2
82	75.5	122	72.0	162	66.6	202	62.1
83	75.4	123	70.9	163	66.5	203	62.0
84	75.3	124	70.8	164	66.3	204	61.9
85	75.1	125	70.7	165	66.2	205	61.7
86	75.0	126	70.6	166	66.1	206	61.6
87	74.9	127	70.5	167	66.0	207	61.5
88	74.8	128	70.3	168	65.9	208	61.2
89	74.7	129	70.2	169	65.8	209	61.3
90	74.6	130	70.1	170	65.7	210	61.2
91	74.5	131	70.0	171	65.6	211	61.1
92	74.4	132	69.9	172	65.5	212	61.0
93	74.2	133	69.8	173	65.3	213	60.9
94	74.1	134	69.7	174	65.2	214	60.7
95	74.0	135	69.6	175	65.1	215	60.6
96	73.9	136	69.4	176	65.0	216	60.5
97	73.8	137	69.3	177	64.9	217	60.4
98	73.7	138	69.2	178	64.8	218	60.3
99	73.6	139	69.1	179	64.7	219	60.2

Table 3. Change in mortality in Japan, 1960-1981

Year (1)	m (2)	b (3)	m_i (4)	bm_i (5)	$m - bm_i$ (6)	$\frac{m - bm_i}{1 - b}$ (7)	V(%) (8)	k (9)	m_c^1 (10)	e^1 (11)	$e^1 + 1$ (12)	$e^1 m_i$ (13)	e^0 (14)	e^0 observed[a/] (15)	Difference (16)
1960	7.6	17.3	30.4	0.5	7.1	7.2	5.74	1.930	13.9	69.1	70.1	2.1	68.0	67.8	-0.2
1961	7.4	17.0	28.3	0.5	6.9	7.0		1.902	13.3	69.8	70.8	2.0	68.8	68.4	-0.4
1962	7.5	17.1	26.2	0.4	7.1	7.2		1.874	13.5	69.6	70.6	1.8	68.8	68.7	-0.1
1963	7.0	17.4	23.0	0.4	6.6	6.7		1.846	12.4	70.8	71.8	1.6	70.2	69.8	-0.4
1964	6.9	17.8	20.2	0.4	6.5	6.6		1.818	12.0	71.2	72.2	1.5	70.7	70.3	-0.4
1965	7.1	18.7	18.4	0.3	6.8	6.9	6.25	1.790	12.4	70.8	71.8	1.3	70.5	70.3	-0.2
1966	6.8	13.8	19.1	0.3	6.5	6.6		1.764	11.6	71.7	72.7	1.4	71.4	71.0	-0.4
1967	6.7	19.4	14.9	0.3	6.4	6.5		1.738	11.3	72.0	73.0	1.1	71.9	71.5	-0.4
1968	6.8	18.7	15.2	0.3	6.5	6.6		1.712	11.3	72.0	73.0	1.1	71.9	71.7	-0.2
1969	6.8	18.5	14.2	0.3	6.5	6.6		1.686	11.1	72.2	73.2	1.0	72.2	71.9	-0.3
1970	6.9	18.7	13.1	0.2	6.7	6.8	7.07	1.660	11.3	72.0	73.0	1.0	72.0	72.0	0.0
1971	6.5	19.1	12.4	0.2	6.3	6.4		1.635	10.5	72.9	73.9	0.9	73.0	72.9	-0.1
1972	6.4	19.2	11.7	0.2	6.2	6.3		1.610	10.1	73.4	74.4	0.9	73.5	73.2	-0.3
1973	6.6	19.4	11.3	0.2	6.4	6.5		1.585	10.3	73.1	74.1	0.8	73.3	73.4	+0.1
1974	6.4	18.4	10.8	0.2	6.2	6.3		1.560	9.8	73.7	74.7	0.8	73.9	73.7	-0.2
1975	6.3	17.1	10.1	0.2	6.1	6.2	7.88	1.535	9.5	74.0	75.0	0.8	74.2	74.4	+0.2
1976	6.3	16.3	9.3	0.1	6.2	6.3		1.509	9.5	74.0	75.0	0.7	74.3	74.8	+0.5
1977	6.1	15.5	8.9	0.1	6.0	6.1		1.482	9.0	74.6	75.6	0.7	74.9	75.3	+0.4
1978	6.1	15.0	8.4	0.1	6.0	6.1		1.456	8.9	74.7	75.7	0.6	75.1	75.7	+0.6
1979	5.9	14.3	8.0	0.1	5.8	5.9		1.429	8.4	75.3	76.3	0.6	75.7	76.2	+0.5
1980	6.2	13.6	7.4	0.1	6.1	6.2	8.83	1.403	8.7	74.9	75.9	0.6	75.3	76.1	+0.8
1981	6.1	13.0	7.1	0.1	6.0	6.1		1.384	8.4	75.3	76.3	0.5	75.8	(76.6)	(+0.8)
1982								1.364							
1983								1.345							
1984								1.325							
1985							9.60	1.306							

Source: Observed expectation of life at birth (column (15)) is taken from: Japan, Institute of Population Problems, Ministry of Health and Welfare, The 34th Abridged Life Tables (April 1, 1980 - March 31, 1981) (Tokyo, 1981), appendix table, page 25. Sources for all other tables are cited in the text.

a/ The calculation period for Japan straddles two calendar years, running from 1 March to 1 March of the second year. The table on page 25 of the Japanese publication gives male and female life expectancies. The mean has been taken to be the expectation of life at birth for the two sexes combined.

Column (1), listing years, is followed by three columns containing the data required for the calculation, namely, the crude death rate (column (2)), the crude birth rate (column (3)) and the infant mortality rate (column (4)). All these rates are per 1,000. They are taken from the United Nations Demographic Yearbooks, particularly the Historical Supplement published in 1979. 5/ For more recent years the data are taken from the United Nations quarterly bulletin Population and Vital Statistics Report. Column (4) is followed by three columns giving the elements used in computing the crude death rate at age 1 and over by expression (3). This rate appears in column (7). Column (8) shows the proportion of persons aged 65 and over in the population in 1960, 1965, 1970, 1975, 1980 and 1985. These figures are taken from a working paper prepared by the Population Division of the Department of International Economic and Social Affairs of the United Nations Secretariat entitled "World population and its age-sex composition by country. 1950-2000: demographic estimation and projection as assessed in 1978 (ESA/P/WP.65, 2 January 1980). They are observed data up to 1975 and a projection thereafter. For these six proportions we enter, from table 1, the six values of the ratio k. They are shown in column (9); ratio k for the intervening years can be derived by interpolation. All that is needed now is to multipy the crude death rate at age 1 and over (column (7)) by k to obtain the standardized death rate for age 1 and over. The result is shown in column (10). In conjunction with each standardized rate we read, from table 2, the corresponding expectation of life at age 11. This gives column (11). Columns (12), (13) and (14) present the calculation, using expression (5), of expectation of life at birth based on life expectancy at age 1 and infant mortality. The resulting expectation of life at birth is shown in column (14), which ends the calculation.

As stated earlier, the relationships represented in figures I and II and tables 1 and 2 are statistical links and, in principle, any observation would differ from the values obtained by applying these results. The results in column (14) of table 3 must therefore be compared with those yielded by direct computation of expectation of life at birth from age-specific mortality statistics. For Japan separate life tables are calculated every year for males and females and the relevant publication contains a retrospectice survey of the respective male and female life expectancies. It has been assumed that the mean of the two would apply to the two sexes combined. These observed expectations of life at birth 6/ are shown in column (15). They differ very little from the calculated expectations of life at birth, and the differences vary very slowly over the period. We have available for Japan a complete annual sequence of observed expectations of life at birth from 1960 to 1980, but if we had had only a few values spaced over time, as is the case for many countries, that would have sufficed for estimating the adjustment to be made to the calculated expectations of life at birth in order to reconstruct the real series fairly closely. That is precisely what we are about to do for one country, Poland, whose statistics are less comprehensive than Japan's.

Before we turn to Poland, however, it seems useful to emphasize that this adjustment phase is unavoidable and is part of the nature of things: the fact that reality differs from the estimate in no way affects the value of the estimate. That the calculated result should coincide with the observed result is not extraordinary when statistical links are allowed for: it is non-coincidence that is the rule and coincidence the exception.

Poland

Table 4 does for Poland what table 3 did for Japan; and we shall not repeat the description of the content of the individual columns. Rather, we shall immediately proceed, in table 5, to compare the results of the calculation (column (14) of table 4) with the observed values for expectation of life at birth in Poland. For Poland the observed data shown in part I of the table are available. They have been extracted from the Polish Statistical Yearbook for 1981. This Yearbook gives expectations of life separately for males and females, and the mean has been assumed to refer to the two sexes combined. Part II of the table shows calculated expectations of life (taken from column (14) of table 4) for the same periods as the observed expectations of life. Part III of the table, "Observed adjustments", indicates the quantities to be deducted from the calculated data in order to make them coincide with the observed data. These adjustments are given in column (15) of table 4. They are known for only some years, but obviously it is easy to interpolate in order to produce adjustments for the intervening years. These interpolated adjustments are shown in brackets in column (15) of table 4. Finally, applying all these adjustments to the calculated expectations of life, we see in colum (16) of table 4 an annual series of adjusted expectations of life at birth that coincides with all the observed values. Japan and Poland are examples of the two categories to be found among industrialized countries. Table 6 shows how the 35 industrialized countries considered are divided between the two categories. It describes the situaiton in a recent period. Certain countries that are classified as Japan-type would have to be classified as Poland-type if one were dealing with earlier years.

Union of Soviet Socialist Republics (USSR)

Before we present the overall results, a third concrete example will be examined because of its importance: the USSR. Table 7 refers to that country. No special comments are called for on columns (5) to (14). As in the case of tables 3 and 4 they are columns of calculations. Columns (2), (3) and (4), which relate to the basic data, do require some explanation. The 1979 Historical Supplement to the United Nations Demographic Yearbook gives the crude annual death and birth rates from 1960 to 1976 and the infant mortality rate from 1961 to 1974. For mortality and natality, the series can be brought up to 1981 thanks to the United Nations quarterly bulletin Population and Vital Statistics Report.

For infant mortality the situation is more complicated. The Soviet authorities have published a life table for the period 1958-1959 7/ which gives a male infant mortality rate of 44.24 per thousand and a female rate of 36.77 per thousand; the mean of 40.05 per thousand can serve for boys and girls combined. Since we find that from 1958-59 to 1961 infant mortality was in a declining phase, the following rates have been assumed from 1958 to 1960:

1958	42.0	
1959	38.0	mean = 40.0
1960	35.3	

Table 4. Changes in mortality in Poland, 1960-1981

Years (1)	m (2)	b (3)	m_i (4)	bm_i (5)	$m - bm_i$ (6)	$\frac{m - bm_i}{1 - b}$ (7)	V(%) (8)	k (9)	m_c^1 (10)	e^1 (11)	$e^1 + 1$ (12)	$e^1 m_i$ (13)	e^0 (14)	Adjustment a/ (15)	Adjusted e^0 (16)
1960	7.6	22.6	56.1	1.3	6.3	6.4	5.77	1.900	12.2	71.0	72.0	4.0	68.0	-0.4	67.6
1961	7.6	20.9	54.1	1.1	6.5	6.6		1.862	12.3	70.9	71.9	3.9	68.0	-0.3	67.7
1962	7.9	19.8	54.8	1.1	6.8	6.9		1.824	12.6	70.6	71.6	3.9	67.7	(-0.3)	67.4
1963	7.5	19.2	48.7	0.9	6.6	6.7		1.786	12.0	71.2	72.2	3.5	68.7	(-0.2)	68.5
1964	7.6	18.1	47.7	0.9	6.7	6.8		1.748	11.9	71.3	72.3	3.4	68.9	(-0.2)	68.7
1965	7.4	17.3	41.7	0.7	6.7	6.8	6.81	1.710	11.6	71.7	72.7	3.0	69.7	-0.2	69.5
1966	7.3	16.7	38.9	0.6	6.7	6.8		1.663	11.3	72.0	73.0	2.8	70.2	-0.1	70.1
1967	7.8	16.3	38.1	0.8	7.2	7.3		1.616	11.8	71.5	72.5	2.8	69.7	(-0.2)	69.5
1968	7.5	16.2	33.4	0.5	7.0	7.1		1.569	11.1	72.2	73.2	2.4	70.8	(-0.2)	70.6
1969	8.1	16.3	34.3	0.6	7.5	7.6		1.522	11.6	71.7	72.7	2.5	70.2	(-0.2)	70.0
1970	8.2	16.8	33.2	0.6	7.6	7.7	8.28	1.475	11.4	71.9	72.9	2.4	70.5	-0.2	70.3
1971	8.6	17.1	29.5	0.5	8.1	8.2		1.444	11.8	71.5	72.5	2.1	70.4	-0.2	70.2
1972	8.0	17.4	28.4	0.5	7.5	7.6		1.413	10.7	71.6	72.6	2.1	70.5	-0.2	70.3
1973	8.3	17.9	25.8	0.5	7.8	7.9		1.381	10.9	72.5	73.5	1.9	71.6	(-0.2)	71.4
1974	8.2	18.4	23.5	0.4	7.8	7.9		1.350	10.7	72.7	73.7	1.7	72.0	(-0.3)	71.7
1975	8.7	18.9	24.9	0.5	8.2	8.4	9.54	1.318	11.1	72.2	73.2	1.8	71.4	-0.3	71.1
1976	8.8	19.5	23.8	0.5	8.3	8.5		1.306	11.1	72.2	73.2	1.7	71.5	-0.3	71.2
1977	9.0	19.1	24.6	0.4	8.6	8.8		1.294	11.4	71.9	72.9	1.8	71.1	(-0.3)	70.8
1978	9.3	19.0	22.4	0.4	8.9	9.1		1.282	11.7	71.6	72.6	1.6	71.0	(-0.3)	70.7
1979	9.2	19.5	21.1	0.4	8.8	9.0		1.271	11.4	71.9	72.9	1.5	71.4	(-0.3)	71.1
1980	9.9	19.3	21.0	0.4	9.5	9.7	10.01	1.260	12.2	71.0	72.0	1.5	70.5	-0.3	70.2
1981	9.2	18.9	20.6	0.4	8.8	9.0		1.275	11.5	71.8	72.8	1.5	71.3	(0.3)	71.0
1985							9.32	1.339							

a/ Observed adjustments are not in brackets. They are taken from table 5, in which calculated expectation of life at birth is compared with observed expectation of life at birth for selected periods. Adjustments in brackets have been interpolated (or extrapolated) on the basis of observed adjustments.

Table 5. Poland: Comparison of calculated expectations of life at birth (table 4) with observed expectations of life at birth for selected periods

(Years)

	1952-1953	1955-1956	1960-1961	1965-1966	1970-1971	1975-1976	1980
I. Observed expectations of life[a]							
Male	58.6	61.8	64.8	66.8	66.8	67.3	66.0
Female	64.2	67.8	70.5	72.8	73.8	75.0	74.4
Mean			67.65	69.80	70.30	71.15	70.20
II. Calculated expectations of life (table 4, column (14))							
			1960 68.0 1961 68.0	1965 69.7 1966 70.2	1970 70.5 1971 70.4 1972 70.5	1975 71.4 1976 71.5	1980 70.5
Mean			68.0	69.95	70.47	71.45	
III. Observed adjustments							
			-0.35	-0.15	-0.17	-0.30	-0.30

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[a] Observed expectations of life are taken from the 1981 Statistical Yearbook of Poland, (Poland, Glówy Urzad Statystyczny, Rocznik statystyczny 1981 (Warsaw, GUS, 1982), table 35(92), page 59).

Table 6. Classification of industralized countries according to information published on expectation of life at birth

Country	Japan-type (unbroken annual series)[a]	Poland-type (discontinuous periods)
Bulgaria		X
Czechoslovakia	X	
German Democratic Republic	X	
Hungary	X	
Poland		X
Romania		X
Union of Soviet Socialist Republics		X
Denmark	X	
Finland	X	
Iceland		X
Ireland		X
Norway	X	
Sweden	X	
England and Walles	X	
Northern Ireland	X	
Scotland	X	
Albania[b]		
Cyprus		X
Greece		X
Israel	X	
Italy		X
Malta	X	
Portugal		X
Spain		X
Yugoslavia		X
Austria	X	
Belgium		X
France	X	
Germany, Federal Republic of	X	
Luxembourg		X
Netherlands	X	
Switzerland		X
Japan	X	
Canada		X
United States	X	
Australia		X
New Zealand		X

Note: The table describes the current situation, in 1983. For earlier years, before 1970, some countries should move from Japan-type to Poland-type.

[a] There are three categories of annual series: year-by-year, three-year moving average and two-year moving average.

[b] The latest official life table is that for 1965-1967.

Table 7. Change in mortality in the USSR, 1960-1981

Years (1)	m (2)	b (3)	m_i (4)	bm_i (5)	$m - bm_i$ (6)	$\frac{m - bm_i}{1 - b}$ (7)	V(%) (8)	k (9)	m_c^1 (10)	e^1 (11)	$e^1 + 1$ (12)	$e^1 m_i$ (13)	e^0 (14)	Adjustment[a] (15)	Adjusted e^0 (16)
1958	7.2	25.3	42.0	1.0	6.2	6.4		1.726	11.0	72.4	73.4	3.0	70.4	-1.5	68.9
1959	7.6	25.0	38.0	1.0	6.6	6.8		1.718	11.7	71.6	72.6	2.9	69.7	-1.5	68.2
1960	7.1	24.9	35.3	0.9	6.2	6.4	6.76	1.710	10.9	72.5	73.5	2.6	70.9	-1.1	69.8
1961	7.2	23.9	32.6	0.8	6.4	6.6		1.690	11.2	72.1	73.1	2.4	70.7	-1.0	69.7
1962	7.5	22.4	32.7	0.7	6.8	7.0		1.670	11.7	71.6	72.6	2.4	70.2	-0.9	69.3
1963	7.2	21.1	31.3	0.7	6.5	6.6		1.650	10.9	72.5	73.5	2.3	71.2	-0.9	70.3
1964	6.9	19.5	29.4	0.6	6.3	6.4		1.630	10.4	73.0	74.0	2.2	71.8	-0.9	70.9
1965	7.3	18.3	27.6	0.5	6.8	6.9	7.38	1.610	11.1	72.2	73.2	2.0	71.2	-0.8	70.4
1966	7.3	18.2	26.1	0.5	6.8	6.9		1.598	11.0	72.4	73.4	1.9	71.5	-0.8	70.7
1967	7.6	17.3	26.3	0.5	7.1	7.2		1.586	11.4	71.9	72.9	1.9	71.0	-0.7	70.3
1968	7.7	17.2	26.4	0.5	7.2	7.3		1.574	11.5	71.8	72.8	1.9	70.9	-0.9	70.0
1969	8.1	17.0	25.8	0.4	7.7	7.8		1.562	12.2	71.0	72.0	1.9	70.1	-0.9	69.2
1970	8.2	17.4	24.4	0.4	7.8	7.9	7.80	1.550	12.2	71.0	72.0	1.8	70.2	-0.9	69.3
1971	8.2	17.8	22.6	0.4	7.8	7.9		1.518	12.0	71.0	72.0	1.6	70.4	-0.9	69.5
1972	8.5	17.8	24.7	0.4	8.1	8.2		1.486	12.2	71.0	72.0	1.6	70.2	-0.9	69.3
1973	8.7	17.6	26.4	0.5	8.2	8.3		1.454	12.1	71.1	72.1	1.9	70.2	-1.0	69.2
1974	8.7	18.0	27.7	0.5	8.2	8.4		1.422	11.9	71.3	72.3	2.0	70.3	-1.2	69.1
1975	9.3	18.1	29.5	0.5	8.8	9.0	8.90	1.389	12.5	70.7	71.7	2.1	69.6	-1.2	68.4
1976	9.5	18.4	31.3	0.6	8.9	9.1		1.368	12.4	70.8	71.8	2.3	69.5	-1.3	68.2
1977	9.6	18.1	33.1	0.6	9.0	9.2		1.347	12.4	70.8	71.8	2.4	69.4	-1.3	68.1
1978	9.7	18.2	34.9	0.6	9.1	9.3		1.325	12.3	70.9	71.9	2.5	69.4	-1.3	68.1
1979	10.1	18.2	36.7	0.7	9.4	9.6		1.304	12.5	70.7	71.7	2.6	69.1	-1.3	67.8
1980	10.3	18.3	38.5	0.7	9.6	9.8	10.00	1.280	12.6	70.6	71.6	2.8	68.8	-1.3	67.5
1981	10.3	18.7	40.3	0.8	9.5	9.7		1.280	12.4	70.8	71.8	2.9	68.9	-1.3	67.5

Source: See text and table 9.

After 1974 we have death rates for ages 0 to 4 for 1975 and 1976. The death rate for ages 0-4 in the USSR was at a minimum in 1971 and rose from 1971 to 1976. Table 8 illustrates this movement.

Table 8. USSR: Trend in the death rate at ages 0-4 and in the infant mortality rate (per 1,000)

Year	(m_i)	0-4	Ratio
1971	22.6	6.7	3.37
1972	24.7	6.8	3.63
1973	26.4	7.2	3.67
1974	27.7	7.7	3.60
1975	(29.5)	8.2	3.60
1976	(31.3)	8.7	3.60

For 1975 and 1976 the 1974 multiplier was applied in order to convert the 0-4 rates into infant mortality areas. Infant mortality for 1975 works out at 29.5 = 8.2 x 3.60 and for 1976 at 31.3 = 8.7 x 3.60. A rise in infant mortality is observed. the year-to-year differences are as follows:

1971-1972	+ 2.1
1972-1973	+ 1.7
1973-1974	+ 1.3
1974-1975	+ 1.8
1975-1976	+ 1.8

We shall now see that the general death rate continued to rise after 1976. It has been assumed that infant mortality was part of that rise, and 1.8 has been added each year to produce estimated rates. The results are:

1977	31.3 + 1.8 = 33.1
1978	33.1 + 1.8 = 34.9
1979	34.9 + 1.8 = 36.7
1980	36.7 + 1.8 = 38.5
1981	38.5 + 1.8 = 40.3

We have thus completed columns (2), (3) and (4) of table 7. All that remains to be done is to carry out the computation so that we can fill in column (14), calculated expectations of life at birth. In table 9, calculated expectations of life are compared with observed expectations of life.

The Soviet authorities have published two life tables, for the periods 1958-1959 and 1968-1971. From the age-specific death rates Roland Pressat 8/ has computed life expectancies for other periods, as shown in table 9. In the USSR, unlike most countries, the mean of male and female life expectancies is lower than the measured life expectancy for the two sexes combined. This is because there are far more women than men, owing to deaths in war and revoluation. Table 9 shows that for the two life tables published by the Soviet authorities the mean must be increased to 0.54 in 1958-1959 and 0.55 in 1968-1971 in order to obtain the life expectancy of both sexes together. Mr. Pressat has found increases of 0.40 for 1971-1972, 0.45 for 1972-1973 and 0.40 for 1973-1974. From 1960 to 1970 a rise of 0.5 has been adopted. No further comments are called for on the remainder of table 9; it is identical to table 5, for Poland. The observed adjustments are shown in column (15) of table 7, yielding an annual series of expectations of life at birth as adjusted to coincide with observations. Figure III illustrates this adjustment operation. It will be seen from the figure that two of the points calculated by Mr. Pressat seem to be anomalous; the point for 1969-1970 and, to a lesser degree, that for 1968-1969. The Soviet table gives, for these two periods together, an adjustment of 0.90, which deviates significantly from the average of the adjustment calculated from Mr. Pressat's data: o.18. Preference has been given to the Soviet table and the two calculated points have been ignored.

Results obtained

Overall result

We shall now present the overall result obtained for the 35 industrialized countries for which the calculation can be performed, (calculation not possible for Albania and Cyprus). We have thought it best in

Table 9. USSR: Comparison of expectations of life at birth as calculated (table 7) and observed values

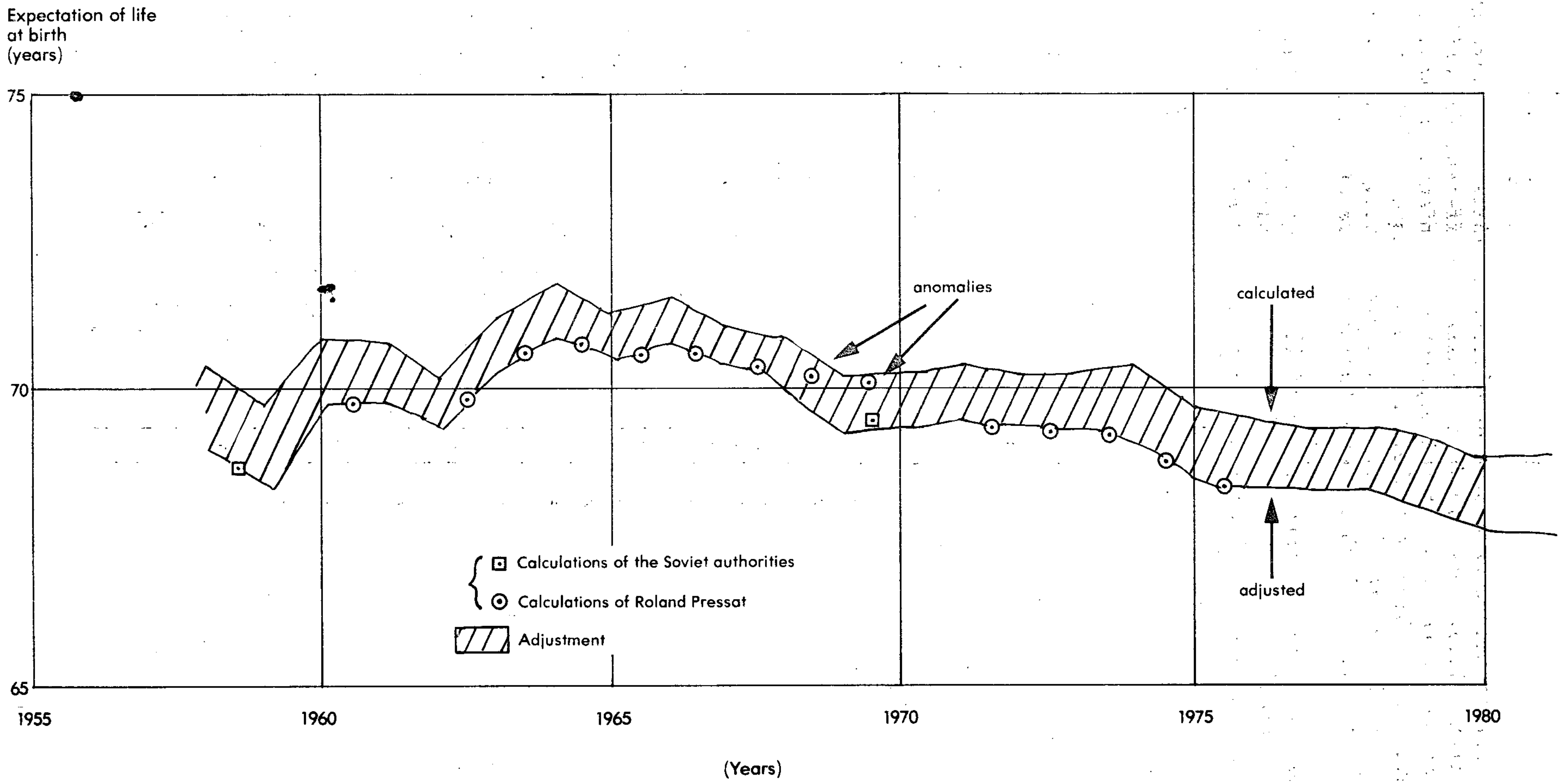
	1958-1959	1960-1961	1962-1963	1963-1964	1964-1965	1965-1966	1966-1967	1967-1968	1968-1969	1969-1970	1968-1971	1971-1972	1972-1973	1973-1974	1974-1975	1975-1976
I. Observed expectations of life																
a. Male	64.42	65.5	65.6	66.2	66.3	66.0	65.9	65.6	65.2	65.0	64.56	64.4	64.3	64.1		
b. Female	71.68	73.0	73.1	73.9	74.1	74.1	74.2	74.2	74.2	74.2	73.53	73.6	73.4	73.3		
c. Mean	68.05	69.25	69.35	70.05	70.20	70.05	70.05	69.90	69.70	69.60	64.05	69.00	68.85	68.70		
d. Both sexes	68.59	69.75	69.85	70.55	70.70	70.55	70.55	70.40	70.20	70.10	69.50	69.40	69.30	69.10	68.70	68.30
e. Difference (d-c)	0.54	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.55	0.40	0.45	0.40		
II. Calculated expectations of life (table 7, column 14)																
f. Both sexes	1958 70.4	1960 70.9	1962 70.2	1963 71.2	1964 71.8	1965 71.2	1966 71.5	1967 71.0	1968 70.9	1969 70.1	1968 70.9	1971 70.4	1972 70.2	1973 70.2	1974 70.3	1975 69.6
g. Both sexes	1959 69.7	1961 70.7	1963 71.2	1964 71.8	1965 71.2	1966 71.5	1967 71.0	1968 70.9	1969 70.1	1970 70.2	1969 70.1	1972 70.2	1973 70.3	1974 70.3	1975 69.6	1976 69.5
h. Both Sexes											1970 70.2					
i. Both sexes											1971 70.4					
j. Mean	70.05	70.80	70.70	71.50	71.50	71.35	71.25	70.95	70.50	70.15	70.4	70.30	70.25	70.25	69.95	69.55
III. Observed adjustments																
h. Adjustment (d-j)	-1.46	-1.05	-0.85	-0.95	-0.80	-0.80	-0.70	-0.55	-0.30a/	-0.05a/	-0.9	-0.90	-0.95	-1.15	-1.25	-1.25

Source: Observed expectations of life at birth for 1958-1959 and 1968-1971 were computed by the Soviet authorities. For other periods they were computed by Roland Pressat "Situation démographique de l'URSS à la veille de son cinquième recensement", Population, vol. 34, no. 4-5 (July-October 1979), p. 856.

Note: In the USSR the mean of male and female life expectancies is lower than life expectancy computed for the two sexes combined. This is because there are many more women than men owing to wartime deaths. The difference was 0.54 in 1958-1959 and 0.55 in 1968-1971. For intervening years 0.50 has been used.

a/ The observed adjustment for 1969-1970 is anomalous. The same is true, to a lesser degree, of the adjustment for 1968-1969. Both deviate from the global adjustment for 1968-1971, and we have given preference to the latter.

Figure III. USSR Expectations of life at birth calculated, observed and adjusted, 1958-1981



Source: See tables 7 and 9.

presenting the result to separate the effects of mortality before and after age 1. Health policies are, in fact, generally different for children under 1 year from those for the rest of the population. Infants are very often given special care. Two tables have therefore been prepared: (a) a table of expectation of life at age 1; and (b) a table showing the difference between expectation of life at birth and expectation of life at age 1.

In order to work out expectation of life at age 1 on the basis of adjusted expectations of life at birth, we have applied expression (5) reversed and written it with $e^1 + 1/2$ being treated as e^o:

$$e^1 = e^o - 1 + m_i e^o \quad (6).$$

or

$$e^1 - e^o = m_i e^o - 1 \quad (7).$$

It may be found surprising that expectation of life at birth is taken into account when, in column (11) of tables 3, 4 and 7, expectations of life at age 1 were already calculated. Would it not have been possible to make the adjustments to column (11)? That would have been possible if observed expectation of life at age 1 had been known, but that particular datum is not always easy to come by. Very often, expecially when countries publish historical series, only observed expectations of life at birth are stated. The annual publications would have to be consulted in order to obtain observed expectation of life at age 1. That is quite possible if a good library is available but it presents considerable labour, with nothing to show for it. That is the reason for taking expectation of life at birth into account in estimating the adjustments.

Infant mortality

The first table of results is table 10. It analyses the movement, from 1960 to 1981 (or 1980 in a small number of countries) of the difference between expectation of life at age 1 and expectation of life at birth. Expression (7) is used to write this difference:

$$e^1 - e^o = m_i e^o - 1.$$

When infant mortality is high, $m_i e^o$ is greater than 1 and the difference is positive. It becomes negative when infant mortality is low. The difference is zero when $m_i = \frac{1}{e^o}$. In the countries considered here, e^o is approximately 70 years. We then have:

$$m_i = \frac{1}{70} = 14.3 \text{ per } 1{,}000.$$

Table 10. Difference between expectation of life at age 1 and expectation of life at birth ($e^1 - e^0$), 1960-1981

(Years)

Country	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	Leeway to be made up before attaining the limiting value		
																							In 1960 x	In 1981 y	Dif. z
Bulgaria	2.3	1.7	1.7	1.6	1.3	1.2	1.3	1.4	1.1	1.2	1.0	0.8	0.9	0.9	0.8	0.7	0.7	0.7	0.6	0.4	0.5	0.5	3.3	1.5	1.8
Czechoslovakia	0.7	0.6	0.6	0.6	0.5	0.8	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.2	0.2	1.7	1.2	0.5
German Democratic Republic	1.8	1.4	1.2	1.2	1.1	0.8	0.7	0.5	0.4	0.4	0.3	0.3	0.3	0.1	0.2	0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	2.8	0.9	1.9
Hungary	2.4	2.2	2.4	2.1	1.9	1.8	1.8	1.6	1.5	1.5	1.5	1.5	1.4	1.4	1.4	1.3	1.1	0.9	0.7	0.7	0.6	0.5	3.4	1.5	1.9
Poland	3.0	2.9	2.9	2.5	2.4	2.0	1.8	1.8	1.4	1.5	1.4	1.1	1.1	0.9	0.7	0.8	0.7	0.8	0.6	0.5	0.5	0.5	4.0	1.5	2.5
Romania	4.4	4.1	3.2	3.0	2.5	2.2	2.4	2.3	3.3	2.9	2.5	2.0	1.9	1.7	1.5	1.5	1.3	1.3	1.2	1.3	1.1		5.4	2.1a/	3.3
Union of Soviet Socialist Republics	1.6	1.4	1.4	1.3	1.2	1.0	0.9	0.9	0.9	0.9	0.8	0.6	0.8	0.9	1.0	1.1	1.3	1.4	1.5	1.6	1.8	1.8	2.6	2.8	-0.2
Denmark	0.6	0.6	0.5	0.4	0.4	0.4	0.2	0.2	0.2	0.1	0.0	0.0	-0.1	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.4	-0.4	1.6	0.6	1.0
Finland	0.5	0.5	0.4	0.3	0.2	0.2	0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.3	-0.3	-0.3	-0.4	-0.4	-0.5	-0.5	1.5	0.6	0.9
Iceland	0.0	0.4	0.3	0.3	0.3	0.1	0.0	0.0	0.0	-0.1	0.0	0.0	-0.2	-0.3	-0.1	-0.1	-0.4	-0.3	-0.2	-0.6	-0.4	-0.4	1.0	0.6	0.4
Ireland	1.1	1.1	1.0	0.9	0.9	0.8	0.7	0.7	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.1	0.1	0.1	-0.1	-0.2	-0.2	2.1	0.8	1.3
Norway	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.4	-0.3	-0.4	-0.4	1.4	0.6	0.8
Sweden	0.2	0.2	0.1	0.1	0.0	0.0	-0.1	0.0	0.0	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.4	-0.4	-0.4	-0.5	-0.5	1.2	0.5	0.7
England and Wales	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	1.6	0.9	0.7
Northern Ireland	0.9	1.1	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.3	0.2	0.2	0.1	0.0		1.9	1.0a/	0.9
Scotland	0.8	0.8	0.8	0.8	0.7	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.3	0.4	0.3	0.2	0.1	0.2	-0.1	-0.1	-0.1		1.8	0.9a/	0.9
Albania b/	4.8				5.1		5.1																5.8		
Cyprus b/															1.0										
Greece	2.0	1.9	2.0	1.9	1.6	1.5	1.5	1.5	1.5	1.4	1.2	1.0	1.0	0.9	0.8	0.8	0.7	0.5	0.5	0.4	0.4	0.2	3.0	1.2	1.8
Israel	1.3	1.4	1.4	1.0	1.1	1.0	0.9	0.9	0.8	0.9	0.8	0.7	0.8	0.7	0.7	0.7	0.5	0.3	0.3	0.2	0.1	0.1	2.3	1.1	1.2
Italy	2.1	1.9	2.0	1.9	1.6	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1.0	0.9	0.7	0.6	0.4	0.3	0.3	0.2	0.1	0.1	3.1	1.1	2.0
Malta	1.7	1.2	1.5	1.4	1.4	1.4	1.1	0.9	1.0	0.7	1.0	0.7	0.2	0.7	0.5	0.3	0.1	0.0	0.1	0.1	0.1	0.1	2.7	1.1	1.6
Portugal	4.4	5.2	4.5	4.1	3.9	3.6	3.5	3.2	3.4	2.9	3.2	2.5	2.0	2.2	1.7	1.8	1.4	1.2	1.0	0.9	0.9		5.4	1.9a/	3.5
Spain	2.1	2.4	2.0	1.9	1.9	1.8	1.6	1.5	1.4	1.2	1.0	0.8	0.6	0.5	0.4	0.4	0.3	0.2	0.1	0.0	-0.2		3.1	0.8a/	2.3
Yugoslavia	4.8	4.7	4.6	4.4	4.2	4.0	3.4	3.4	3.1	3.0	2.9	2.5	2.1	2.2	2.0	1.9	1.7	1.6	1.4	1.3	1.4		5.8	2.4a/	3.4
Austria	1.6	1.3	1.3	1.2	1.1	1.0	1.0	0.9	0.8	0.8	0.9	0.9	0.8	0.7	0.7	0.5	0.3	0.2	0.1	0.1	0.1	-0.1	2.6	0.9	1.7
Belgium	1.2	1.0	1.0	0.9	0.8	0.7	0.8	0.6	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.2	0.1	-0.1	-0.1	-0.2	-0.2	-0.1	2.2	0.9	1.3
France	1.0	0.8	0.8	0.8	0.7	0.6	0.6	0.5	0.5	0.4	0.3	0.3	0.2	0.1	0.1	0.0	-0.1	-0.1	-0.2	-0.2	-0.3	-0.3	2.0	0.7	1.3
Germany, Federal Republic of	1.4	1.3	1.1	0.9	0.8	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.5	0.4	0.3	0.1	0.0	0.0	-0.1	-0.1	2.4	0.9	1.5
Luxembourg	1.2	0.9	1.2	1.0	1.1	0.7	0.9	0.4	0.2	0.2	0.7	0.4	0.0	0.0	-0.1	0.0	0.3	-0.2	-0.2	0.0	-0.2	0.0	2.2	1.0	1.2
Netherlands	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.4	1.3	0.6	0.7
Swetzerland	0.5	0.5	0.5	0.5	0.4	0.3	0.2	0.3	0.2	0.1	0.1	0.1	0.0	0.0	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4		1.5	0.6	0.9
Japan	1.1	1.0	0.8	0.6	0.5	0.3	0.4	0.1	0.1	0.0	0.0	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.4	-0.5	2.1	0.5	1.6
Canada	1.0	1.0	1.0	0.9	0.8	0.7	0.7	0.6	0.5	0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	2.0	0.8	1.2
United States	0.9	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.0	0.0	0.0	-0.1	-0.1	1.9	0.9	1.0
Australia	0.5	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.0	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	1.5	0.8	0.7
New Zealand	0.6	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.2	0.0	0.0	0.0	0.0	-0.1	-0.1	1.6	0.9	0.7

a/ In 1980.

b/ See foot-note to table 11.

This is the order of magnitude below which the difference becomes negative. When infant mortality is nil the difference equals -1.

We then turn to the last three colums of table 10. The first of these columns, marked "x", shows, for 1960, the leeway to be made up before the -1 limiting value is attained. The second column, marked "y", gives the same distance as from 1980. The third, marked "z", is the difference between the two. The figures in column y indicate the gains in expectation of life at birth that could be made from 1980 onwards by reducing infant mortality to zero. It will be seen that these gains are low everywhere, but especially in Northern Europe, Western Europe, Overseas Europe and Japan. It is in the Soviet Union that most progress would have to be made, because of the recent rise in infant mortality in that country. The effects on expectation of life at birth of the movement of infant mortality from 1960 to 1980 are measurered by the figures in column z. They are all positive except in the Soviet Union, which shows that in all other countries infant mortality has declined. In those which had relatively high infant mortality in 1960, the gain in expectation of life caused by the fall in infant mortality has been very significant. That is the case in many countries of Western and Southern Europe.

It is the size of these gains, owing to a very specific variation in mortality, that of children under age 1, that has induced us to distinguish between mortality before and mortality after the first birthday.

Mortality at age 1 and over

Table 11 gives the results for mortality after age 1. It shows the movement from 1960 to 1981 (1980 in a few countries) of expectation of life at age 1.

Figure IV provides a preliminary picture of the changes that occurred during the period. Two groups of countries (Eastern Europe and capitalist European countries) are shown, together with Japan and the USSR. The expectations of life of each group have been computed by taking the arithmetic mean of the figures in table 11. The resulting four curves show, for 1960-1981, very disparate trends. Whereas all the countries were at very similar levels about 1965, they afterwards deviated, and the four curves form a fan which opens wider with time and shows no sign of altering its movement. At the bottom of the fan is the USSR, where the health of the population of age 1 and over is deteriorating steadily from year to year. Then comes Eastern Europe, where the level has changed little during the period but shows a tendency towards higher mortality towards the end of the period. Contrasing with those two situations are the situations in the capitalist European countries, in which health is improving continuously, and last comes Japan, which beats all records for improvement.

Figure V complements figure IV by showing dispersion about the mean. It gives the distribution of the 35 countries by expectation of life at age 1 in 1965 and 1980. The four countries represented by the curves in figure IV - the USSR, Eastern Europe, capitalist European countries, Japan - are shown

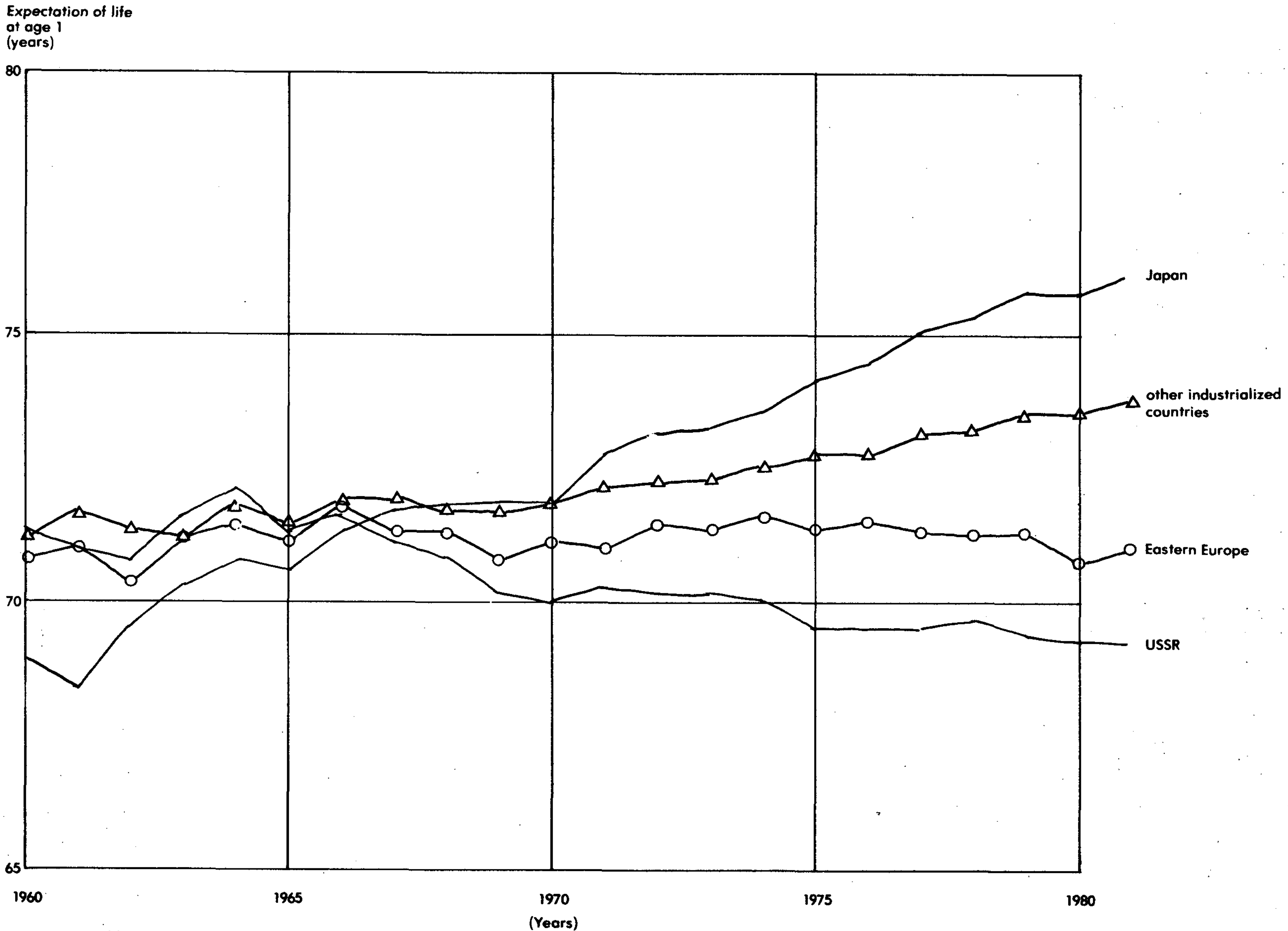
Table 11. Expectation of life at age 1, 1960-1981

(Years)

Country	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Bulgaria	71.7	72.0	70.8	71.9	72.4	72.2	72.3	71.5	72.4	71.3	72.3	71.5	71.7	72.4	72.1	71.7	72.2	71.6	72.0	72.0	71.7	71.7
Czechoslovakia	71.2	70.9	70.6	71.1	71.2	71.0	71.1	71.1	70.8	70.3	70.2	70.3	70.8	70.5	70.6	70.9	71.0	71.0	70.9	71.1	70.7	71.0
German Democratic Republic	70.7	70.9	70.8	71.4	71.3	71.3	71.4	71.4	70.9	70.8	71.0	71.4	71.5	71.6	71.9	71.4	71.6	71.9	71.8	71.6	71.2	71.6
Hungary	70.9	71.7	70.7	71.5	71.8	71.4	72.2	71.6	71.3	71.4	71.2	71.1	71.6	71.2	71.2	71.1	71.2	71.3	70.6	70.8	70.2	69.9
Poland	70.6	70.6	70.3	71.0	71.1	71.5	71.9	71.3	72.0	71.5	71.7	71.3	71.4	72.3	72.4	71.9	71.9	71.6	71.3	71.6	70.7	71.5
Romania	70.3	70.1	69.1	70.8	71.0	70.3	71.3	70.5	71.0	69.8	70.6	70.5	71.0	70.3	71.4	71.3	70.9	71.2	71.2	71.1	70.4	
Mean, Eastern Europe	70.9	71.0	70.4	71.3	71.5	71.3	72.7	71.3	71.4	70.8	71.1	71.0	71.5	71.4	71.6	71.4	71.5	71.4	71.3	71.4	70.7	(71.0)
Union of Soviet Socialist Republics	71.4	71.0	70.7	71.6	72.1	71.4	71.6	71.1	70.9	70.1	70.0	70.2	70.1	70.1	70.0	69.5	69.5	69.5	69.6	69.4	69.3	69.3
Denmark	72.8	73.2	72.7	72.9	72.8	72.9	73.4	73.5	73.5	73.7	73.4	73.4	73.3	73.5	73.6	73.9	73.6	74.5	74.2	73.9	73.8	73.8
Finland	69.5	69.4	69.1	69.4	69.4	69.1	69.4	69.7	69.7	69.7	70.3	69.9	70.6	70.8	70.9	71.4	71.5	72.0	72.4	72.6	72.8	73.0
Iceland	74.1	73.6	73.9	73.4	73.7	74.0	73.4	73.6	73.7	73.6	73.7	73.6	74.2	74.5	74.9	74.6	76.2	76.1	76.1	76.2	76.2	76.2
Ireland	71.6	70.6	71.0	71.1	71.6	71.5	70.7	72.1	71.4	70.2	71.2	71.9	71.2	71.4	71.2	72.0	72.0	72.0	72.6	73.0	72.9	73.1
Norway	73.9	73.9	73.8	73.0	72.4	74.0	74.0	73.2	73.0	72.9	74.1	74.2	74.3	74.4	74.4	74.6	74.8	75.1	75.1	75.2	75.4	75.7
Sweden	73.3	73.7	73.5	73.7	73.8	73.9	74.1	74.2	74.0	74.0	74.4	74.4	74.5	74.6	74.7	74.1	74.5	75.0	75.1	75.2	75.3	75.3
Ingland and Wales	71.9	71.4	71.6	71.3	71.7	71.9	71.9	72.4	72.1	72.0	72.3	72.7	72.2	72.4	72.7	73.0	72.7	73.4	73.3	73.3	73.7	73.7
Northern Ireland	70.9	70.5	71.5	70.9	71.5	71.4	70.9	72.4	71.5	71.2	71.2	71.4	70.8	70.3	70.4	71.0	70.8	71.0	71.7	71.4	71.6	
Scotland	70.2	69.8	69.8	70.7	70.4	70.2	70.1	71.0	70.5	70.5	70.5	71.0	70.7	70.9	70.8	71.3	71.1	71.6	71.2	71.2	71.8	
Mean, Northern Europe	72.1	71.8	71.9	71.8	71.9	72.2	72.0	72.5	72.2	72.0	72.3	72.5	72.4	72.5	72.6	72.9	73.0	73.4	73.5	73.6	73.7	(74.4)
Albania[a]	70.0				70.0		71.0															
Cyprus[a]														72.5								
Greece	71.5	71.0	70.8	70.8	70.7	71.6	72.0	72.0	72.4	73.1	73.1	73.1	73.1	73.1	73.6	73.3	73.3	73.4	73.7	73.8	73.7	73.8
Israel	72.9	73.1	73.7	73.5	73.2	72.4	73.2	72.9	71.9	71.9	72.1	72.5	72.3	72.4	72.4	72.8	73.5	73.3	73.5	73.8	73.7	74.5
Italy	71.7	72.2	71.4	71.4	72.1	71.6	72.4	72.3	71.8	72.0	72.7	72.9	73.4	73.0	73.4	73.1	73.4	73.7	74.1	74.2	74.2	74.3
Malta	70.4	70.0	70.6	70.1	71.3	70.0	70.9	70.7	71.6	71.3	71.4	71.4	72.0	70.8	71.4	71.0	70.8	70.5	70.2	71.5	70.7	72.1
Portugal	68.4	68.3	68.6	68.4	68.9	68.3	68.5	69.4	69.8	69.2	70.5	69.5	70.7	70.2	70.4	70.8	70.5	72.0	71.5	72.2	71.0	
Spain	71.5	72.3	71.5	71.8	72.5	72.7	72.3	72.5	72.9	72.1	73.1	72.3	73.4	72.9	73.1	73.4	73.5	73.4	73.3	74.4	74.7	
Yugoslavia	67.2	69.8	67.4	69.9	69.1	69.9	71.1	70.0	70.2	69.3	70.3	70.6	70.1	71.0	71.4	71.1	71.5	71.7	71.4	71.7	71.2	
Mean, Southern Europe	70.5	71.0	70.6	70.8	71.1	70.9	71.5	71.4	71.5	71.3	71.9	71.8	72.1	71.9	72.4	72.2	72.4	72.6	72.5	73.1	72.7	(73.7)
Austria	70.1	71.0	70.4	70.5	71.1	70.5	71.2	70.9	70.9	70.7	70.8	71.0	71.3	71.8	71.8	71.8	71.9	72.3	72.3	72.6	72.5	72.6
Belgium	71.2	72.2	71.6	71.3	72.2	71.7	71.7	71.9	70.9	71.2	71.6	71.7	72.0	72.0	72.2	72.1	72.2	73.0	72.6	73.0	72.9	73.2
France	71.3	71.6	71.2	71.2	72.0	71.8	72.1	72.0	72.0	71.6	72.4	72.4	72.6	72.6	72.9	72.9	73.1	73.7	73.8	74.0	74.0	73.8
Germany, Federal Republic of	70.4	71.1	71.1	70.7	71.4	71.1	71.2	71.2	70.7	70.7	71.1	71.4	71.4	71.6	72.0	71.7	72.4	72.9	72.7	73.0	73.2	72.9
Luxembourg	70.2	71.1	69.7	70.3	70.6	70.1	69.8	69.7	69.7	69.5	70.0	69.6	71.0	71.0	70.9	70.9	70.6	72.0	71.8	72.8	72.6	72.6
Netherlands	73.6	73.8	73.5	73.2	73.9	73.7	73.7	73.8	73.7	73.6	73.5	73.8	73.7	74.1	74.4	74.3	74.6	74.9	74.9	75.3	75.4	75.1
Switzerland	72.6	72.9	72.2	71.5	72.7	72.5	72.7	73.0	72.3	72.6	73.3	74.0	74.0	74.0	73.9	75.0	74.8	75.2	75.1	75.2	75.2	75.1
Mean, Western Europe	71.3	72.0	71.4	71.2	72.0	71.6	71.8	71.8	71.5	71.4	71.8	72.0	72.4	72.4	72.6	72.7	72.8	73.4	73.3	73.7	73.7	73.7
Japan	68.9	68.4	69.5	70.4	70.8	70.6	71.4	71.6	71.8	71.9	71.9	72.8	73.1	73.2	73.5	74.2	74.5	75.0	75.3	75.8	75.7	76.1
Canada	72.0	72.2	72.2	72.1	72.7	72.4	72.7	72.9	73.0	73.0	73.1	73.2	73.1	73.2	73.4	73.5	73.9	74.0	73.9	74.1	74.2	74.4
United States	70.8	71.1	70.9	70.8	71.1	71.1	71.0	71.3	70.9	71.1	71.3	71.5	71.6	71.7	72.3	72.9	73.0	73.3	73.5	74.0	73.7	74.1
Australia	71.6	71.6	71.5	71.5	71.0	71.4	71.9	71.4	70.7	71.3	70.7	71.5	71.1	72.1	71.8	72.7	72.8	73.3	73.5	74.0	74.3	74.3
New Zealand	71.9	71.6	71.6	71.4	71.5	71.5	71.2	72.1	72.3	71.7	71.5	71.8	71.9	71.7	72.1	72.3	72.4	72.2	73.0	72.7	73.0	73.1
Mean, overseas Europe	71.6	71.6	71.6	71.4	71.6	71.6	71.7	71.9	71.7	71.0	71.7	72.0	71.9	72.2	72.4	72.9	73.0	73.2	73.5	73.7	73.8	74.0

a/ *Demographic Yearbook, Special Issue, Historical Supplement* (United Nations publication: Sales No. E/F.79.XIII.8). See pages 556 for Albania and 552 for Cyprus. The mean of male and female life expectancies at age 1 has been used.

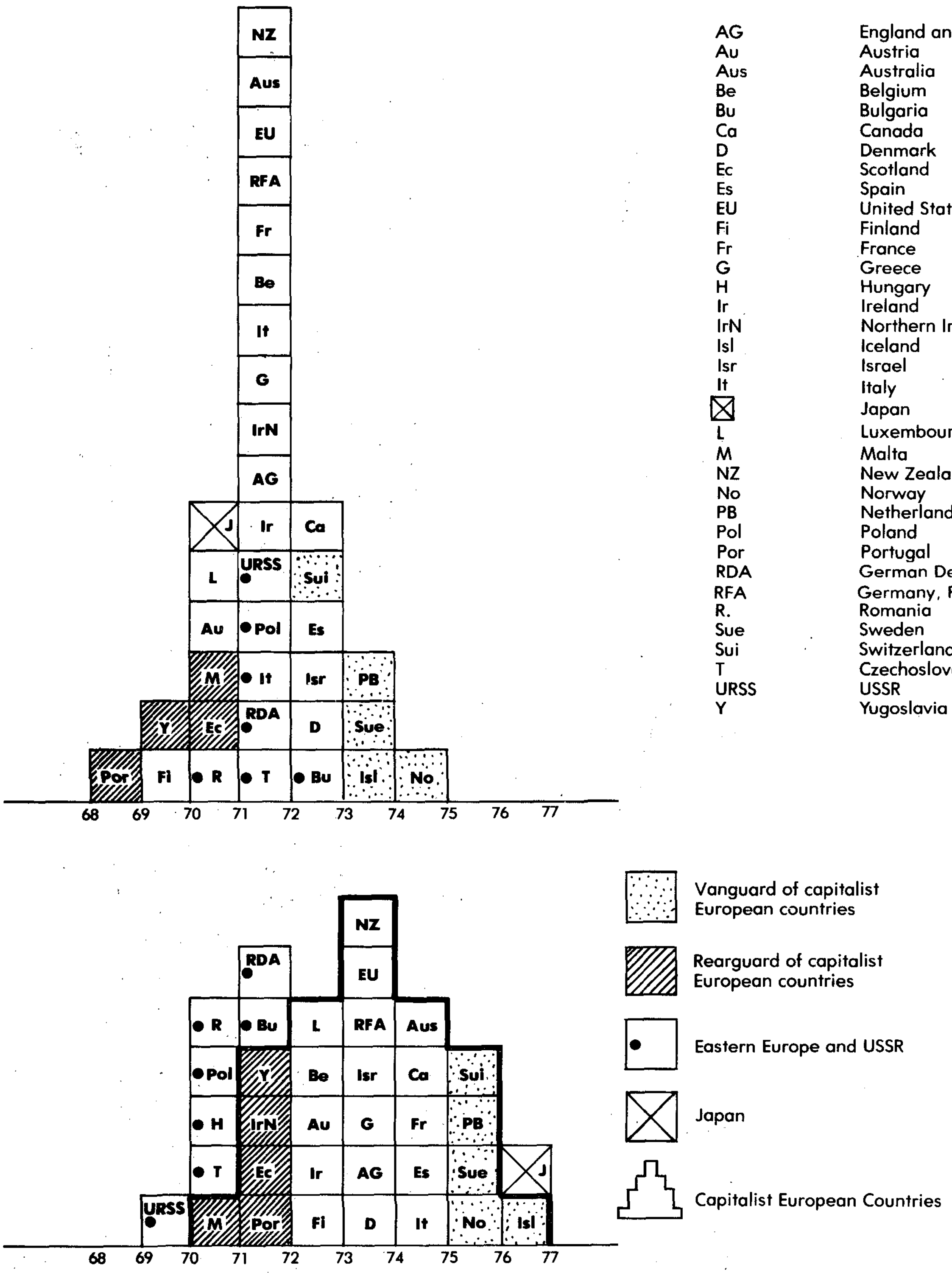
Figure IV. Expectation of life at age 1 in industrialized countries, 1960-1981



Source: See table 11.

a/ Northern Europe, Overseas Europe, Western Europe, Southern Europe.

Figure V. Distribution of 35 industrialized countries according to expectation of life at age 1, 1965 and 1980

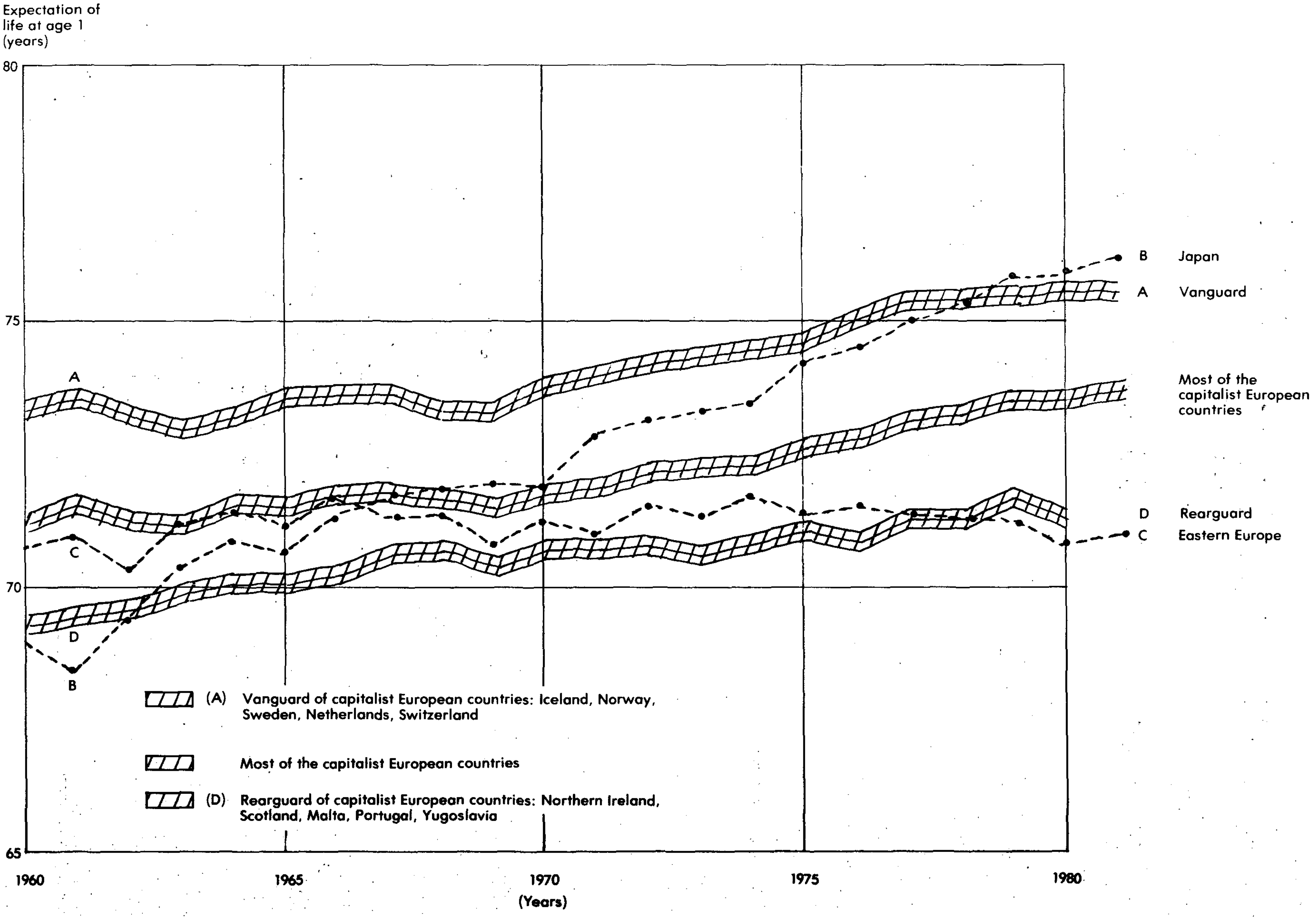


AG	England and Wales
Au	Austria
Aus	Australia
Be	Belgium
Bu	Bulgaria
Ca	Canada
D	Denmark
Ec	Scotland
Es	Spain
EU	United States
Fi	Finland
Fr	France
G	Greece
H	Hungary
Ir	Ireland
IrN	Northern Ireland
Isl	Iceland
Isr	Israel
It	Italy
☒	Japan
L	Luxembourg
M	Malta
NZ	New Zealand
No	Norway
PB	Netherlands
Pol	Poland
Por	Portugal
RDA	German Dem. Rep.
RFA	Germany, Fed. Rep. of
R.	Romania
Sue	Sweden
Sui	Switzerland
T	Czechoslovakia
URSS	USSR
Y	Yugoslavia

Expectation of life at age 1 (years)

Source: See table II.

Figure VI. Expectation of life at age 1 in Europe and Japan, 1960-1981



Source: Based on data of table 11.

separately. The earlier comments about figure IV now become clear. About 1965 the 35 countries were fairly close to one another. Dispersion about the mean was low. Thereafter, in 1980, the four groups mentioned above emerged. The values for all the countries of Eastern Europe are very similar, which justifies the use of averages in figure IV. The spread within the group of capitalist European countries is larger, and a vanguard and a rearguard can be distinguished: vanguard: Iceland, Norway, Sweden, the Netherlands and Switzerland; rearguard: Malta, Scotland, Northern Ireland, Portugal and Yugoslavia.

If these two subgroups are isolated, the result is figure VI. The vanguard, the rearguard and the remainder of the capitalist European countries follow broadly parallel trends, the intervals between groups remaining the same. At the beginning of the period the rearguard is some distance below Eastern Europe but the difference shrinks with time and disappears in 1977, with Eastern Europe falling below the rearguard.

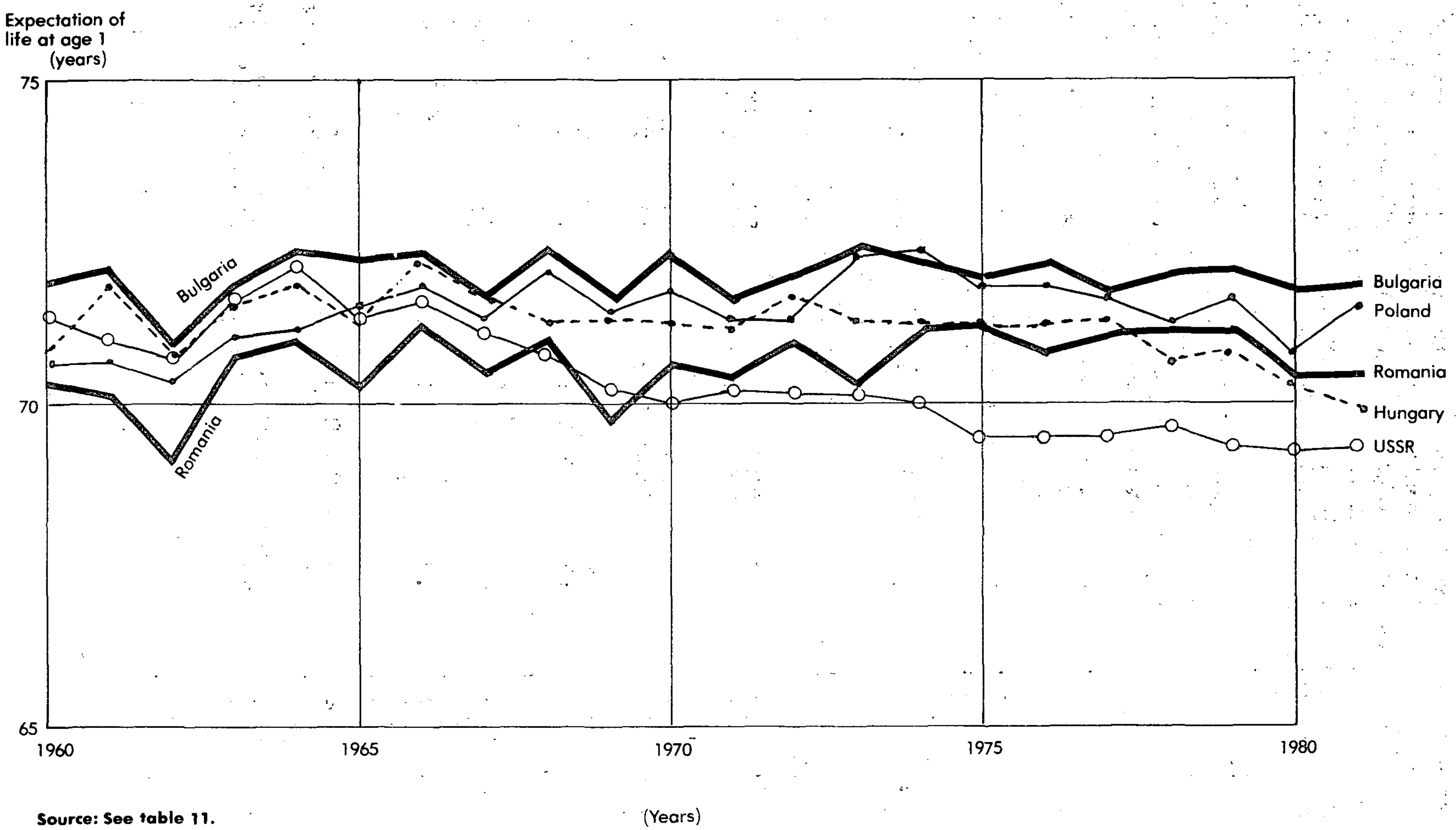
Figure VII covers only Eastern Europe. In this group of six countries the vanguard is Bulgaria and the rearguard Romania. The other countries always lie between the two, except towards the end of the period, when mortality for Hungary rises so much that it ranks last. It is then close to the USSR. Also to be noted is a worsening of the situation in Poland at the end of the period.

Such is the information that can be elicited by our method. Before taking it further, we first have to see what the trends in male and female mortality were.

SEX-SPECIFIC MORTALITY

Theoretically, there is no a priori obstacle to repeating the whole of the foregoing analysis for males and females separately. Unfortunately, things are more complicated in practice. Crude death rates are rarely given separately for males and females. True, the infant mortality rate is very often computed by sex, but these sex-specific rates do not become available until later, and then all the calculations would have to be redone in order to plot separately for males and females the curves in figures I and II. That would represent considerable labour and would not be followed by application, owing to lack of data. Accordingly, in order to study changes in male mortality and female mortality, one must confine oneself to the data published by countries - meaning that we cannot obtain complete annual series. On the other hand, instead of the comparison being limited to two ages - under age 1 and age 1 and over - it could be spread over the entire lifetime. Here we have confined ourselves to three benchmarks - 1960, 1970 and 1980 - and compared for a selected number of countries expectations of life at different ages, separately for males and females. Of course, what we have learned by analysing tables 10 and 11 will guide us in the choice of countries. Table 12 and figure VIII give the results of the comparison. Let us say at once that the USSR is not among the slected countries, which is unfortunate because,

Figure VII. Expectation of life at age 1 in Eastern Europe and the USSR, 1960-1981



Source: See table 11.

Table 12. Gains (+) or losses (-) in sex-specific life expectancy at certain ages for two periods: 1960-1970 and 1970-1980

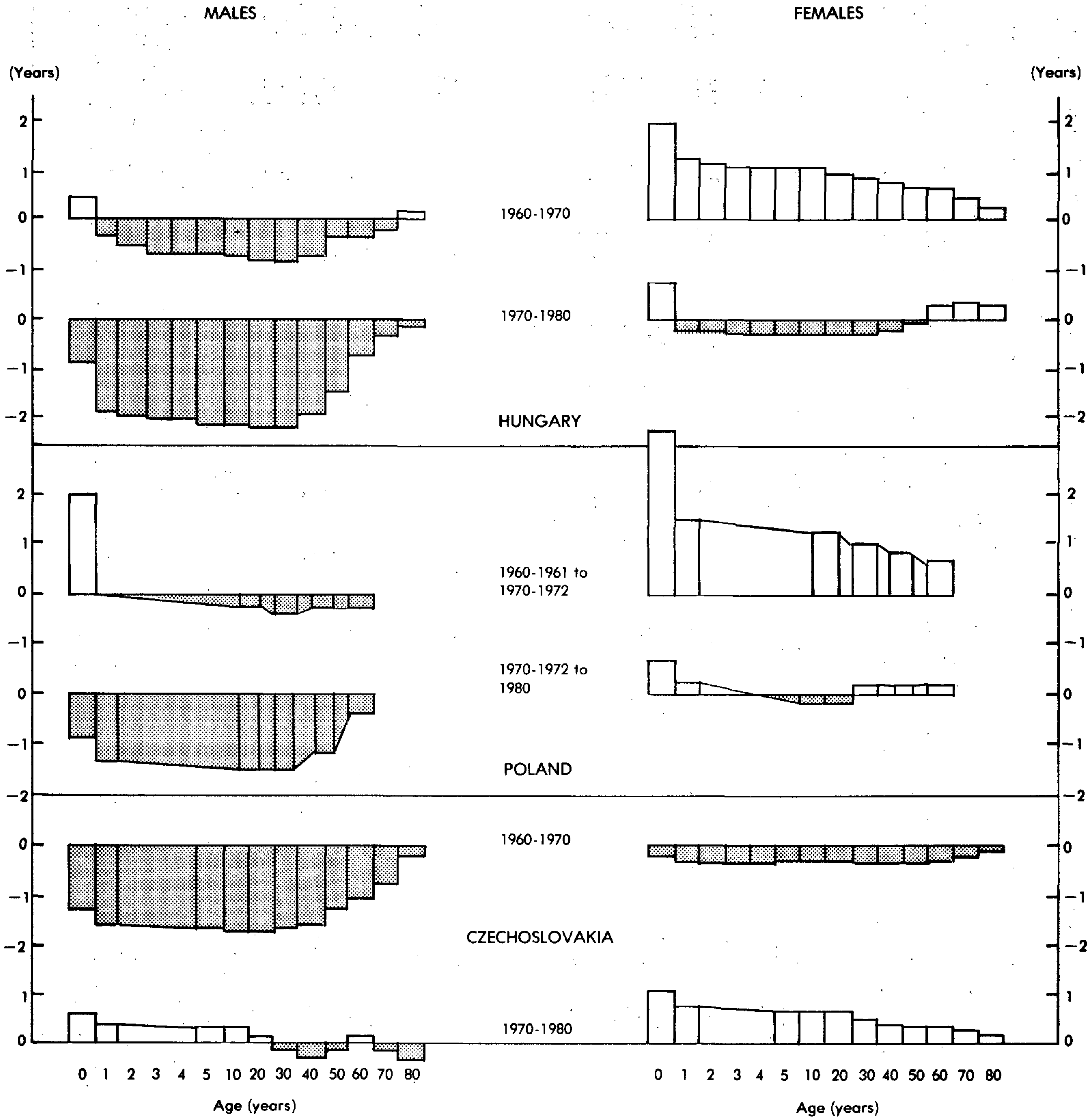
Age	Hungary		Poland		Czechoslovakia		German Democratic Republic		Germany, Federal Republic of		Japan		Northern Ireland		Sweden	
(Years)	1960-1970	1970-1980	1960/61-1970/72	1970/72-1980	1960/61-1970	1970-1980	1960-1970	1970-1979	1960/62-1970/72	1970/72-1978/80	1960-1970	1970-1980	1959/61-1969/71	1969/71-1977/79	1960-1970	1970-1980
								I. MALES								
0	+0.4	-0.9	+2.0	-0.8	-1.4	+0.6	+1.6	+0.6	+0.6	+2.2	+4.0	+4.2	0.4	+0.3	1.0	0.6
1	-0.4	-1.9	0.0	-1.4	-1.5	+0.3	+0.2	+0.2	-0.1	+1.5			0.1	-0.4	0.5	0.2
2	-0.5	-2.0					-0.0	+0.2					+0.0	-0.4		
3	-0.6	-2.0														
4	-0.6	-2.0														
5	-0.6	-2.0			-1.7	+0.2	-0.2	+0.1	-0.2	+1.4	+2.4	+3.6	+0.0	-0.4	0.4	0.2
10	-0.6	-2.0	-0.2[a]	-1.5[a]	-1.7	+0.2	-0.2	+0.1	-0.2	+1.3	+2.3	+3.5	+0.0	-0.5		
20	-0.7	-2.1			-1.7	+0.1	-0.3	+0.1	-0.1	+1.2	+2.2	+3.4	-0.0	-0.3	0.5	-0.0
30	-0.7	-2.1	-0.4	-1.5	-1.7	-0.1	-0.3	+0.1	-0.1	+1.1	+1.8	+3.2	-0.0	-0.2		
40	-0.7	-1.9	-0.3[b]	-1.1[b]	-1.6	-0.3	-0.3	+0.1	-0.1	+1.0	+1.7	+3.0	-0.1	-0.1	0.5	-0.0
50	-0.4	-1.4			-1.2	-0.2	-0.3	+0.2	-0.1	+1.0	+1.5	+2.8	+0.0	-0.1	0.5	+0.0
60	-0.4	-0.6	-0.3	-0.3	-1.0	+0.1	-0.3	+0.3	-0.2	+1.0	+1.1	+2.5	-0.0	-0.0	0.5	+0.0
70	-0.2	-0.3			-0.7	-0.1	-0.3	+0.1	-0.2	+0.6	+0.7	+1.7	+0.1	-0.3	0.5	+0.0
80	+0.1	-0.1			-0.1	-0.3	+0.1	-0.2	-0.1	+0.4	+0.4	+1.0			0.4	+0.0
								II. FEMALES								
0	+2.0	+0.7	+3.3	-0.6	-0.2	+1.0	+2.0	+1.4	+1.4	+2.5	+4.5	+4.3	+1.6	+0.8	2.1	1.8
1	+1.2	-0.2	+1.5	+0.2	-0.3	+0.7	+0.8	+1.0	+0.9	+2.0			+1.3	+0.4	1.9	1.5
2	+1.1	-0.2					+0.6	+1.0					+1.2	+0.4		
3	+1.0	-0.3														
4	+1.0	-0.3														
5	+1.0	-0.3			-0.3	+0.6	+0.6	+1.0	+0.8	+1.9	+3.0	+3.8	+1.2	+0.4	1.7	1.5
10	+1.0	-0.3	+1.2[a]	-0.1[a]	-0.3	+0.6	+0.5	+0.9	+0.8	+1.9	+2.9	+3.8	+1.2	+0.4		
20	+1.0	-0.3			-0.3	+0.6	+0.5	+0.9	+0.8	+1.8	+2.7	+3.7	+1.2	+0.4	1.8	1.3
30	+0.8	-0.3	+1.0[b]	+0.1[b]	-0.3	+0.5	+0.3	+0.8	+0.8	+1.8	+2.4	+3.6	+1.2	+0.4		
40	+0.7	-0.2	+0.8	+0.1	-0.4	+0.4	+0.2	+0.9	+0.7	+1.7	+2.1	+3.4	+1.1	+0.4	1.7	1.3
50	+0.7	-0.1			-0.4	+0.4	+0.1	+0.8	+0.7	+1.6	+1.8	+3.1	+1.1	+0.3	1.7	1.3
60	+0.6	+0.2	+0.7	+0.1	-0.3	+0.3	+0.1	+0.7	+0.6	+1.5	+1.4	+2.8	+1.1	+0.3	1.6	1.2
70	+0.4	+0.4			-0.2	+0.2	+0.1	+0.6	+0.5	+1.2	+1.0	+2.2	+1.3	+0.2	1.3	1.1
80	+0.2	+0.3			-0.1	+0.0	+0.1	+0.3	+0.3	+0.8	+0.4	+1.3			0.7	0.8

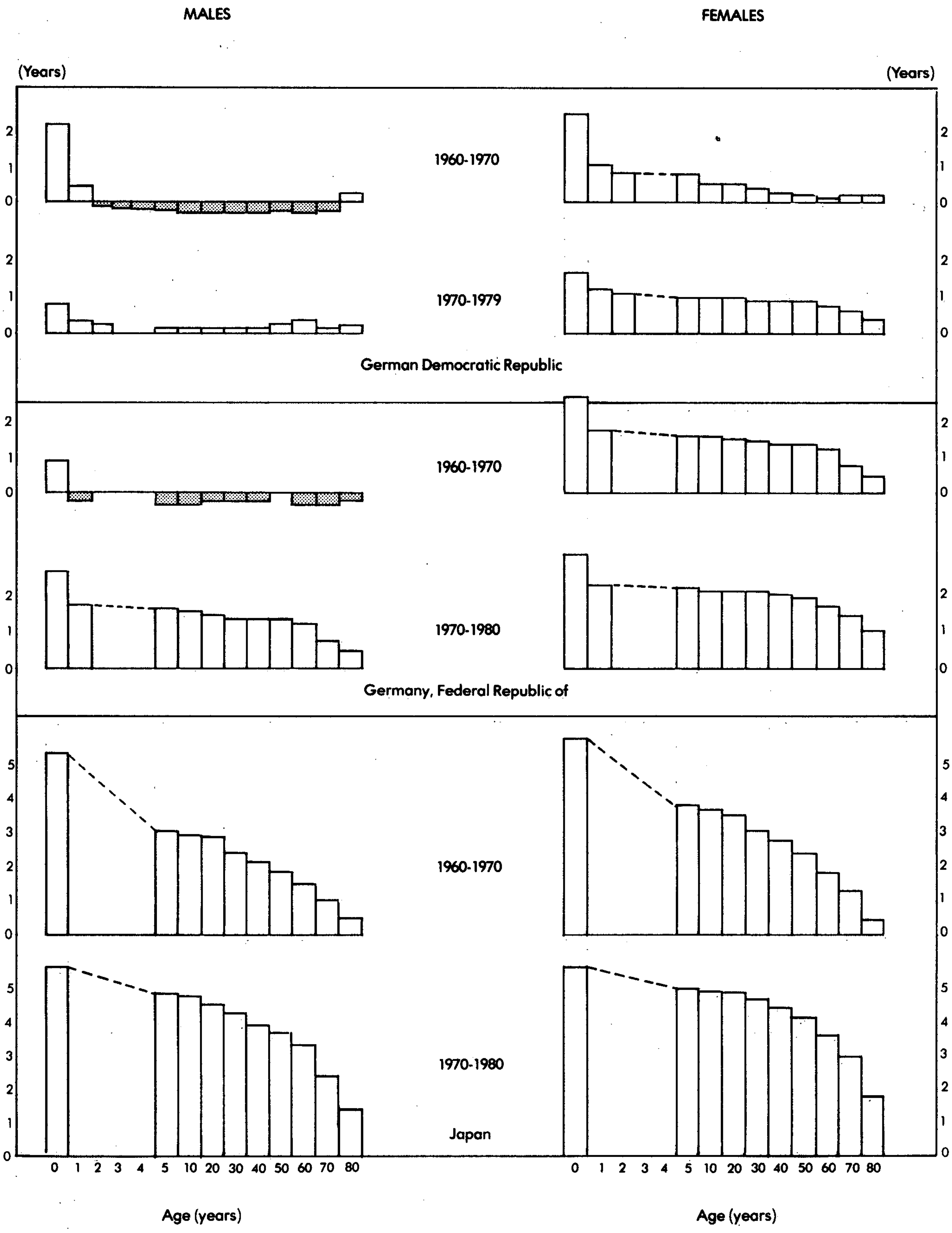
Sources: Hungary: Statistical Yearbook of Hungary, 1980 (Központi Statisztikai Hivatal, Statisztikai Evkönyv 1980 (Budapest, 1981), p. 81); Poland: Polish Statistical Yearbook, 1981 (Glówny Urzad Statystyczny, Rocznik statystyczny 1981 (Warszawa, GUS, 1982, p. 59); Czechoslovakia: Federálné Statisticky Urad, Demografická Prirucka (1982), p. 240; German Democratic Republic: Stattliche Zentralverwaltung für Statistik, Statistisches Jahrbuch der Deutschen Demokratischen Republik 1981 (Berlin, 1981), p. 372; Japan: Statistical Yearbook 1981 (Tokyo, 1981), p. 47 for 1960 and 1970. For 1980, Institute of Population Problems, Ministry of Health and Welfare, The 34th Abridged Life Table (April 1980 - 31 March, 1981 (Tokyo, 1981); Northern Ireland: United Nations Demographic Yearbooks for 1959-61 and 1969-71. For 1977-79, Ulster Yearbook 1983, p. 12; Sweden: Council of Europe, European Demographic Conference, 1982 - National Report of Sweden, pp. 30 and 31.

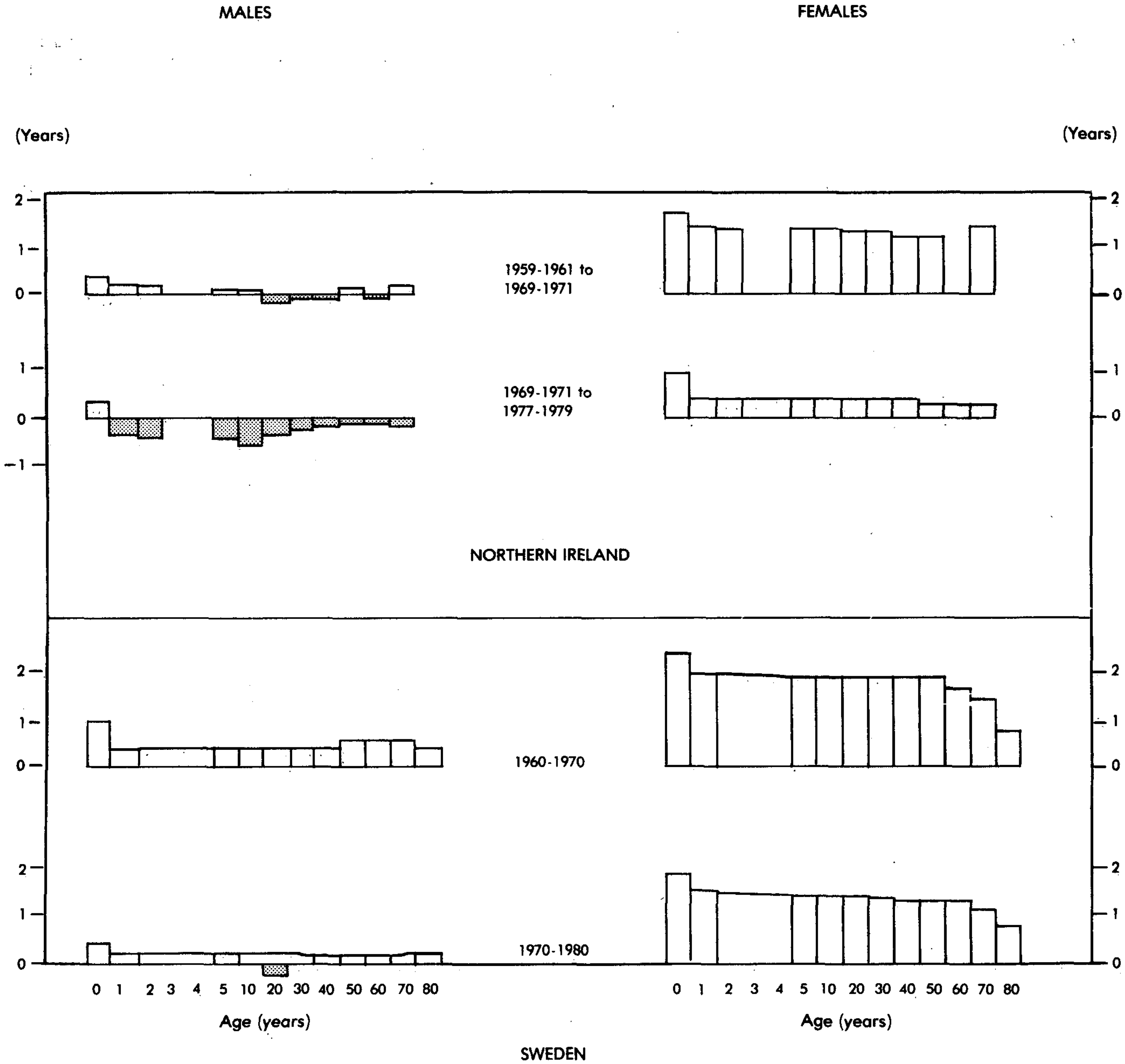
[a] For age 15.
[b] For age 45.

Figure VIII. Gains or losses in sex-specific life expectancy at various ages during two periods, 1960-1970 and 1970-1980, for selected countries

(Gains or losses in years)




MALES
FEMALES
(Years)
(Years)
1960-1970
1970-1979
German Democratic Republic
1960-1970
1970-1980
Germany, Federal Republic of
1960-1970
1970-1980
Japan
0
1
2
3
4
5
0 1 2 3 4 5 10 20 30 40 50 60 70 80
0 1 2 3 4 5 10 20 30 40 50 60 70 80
Age (years)
Age (years)



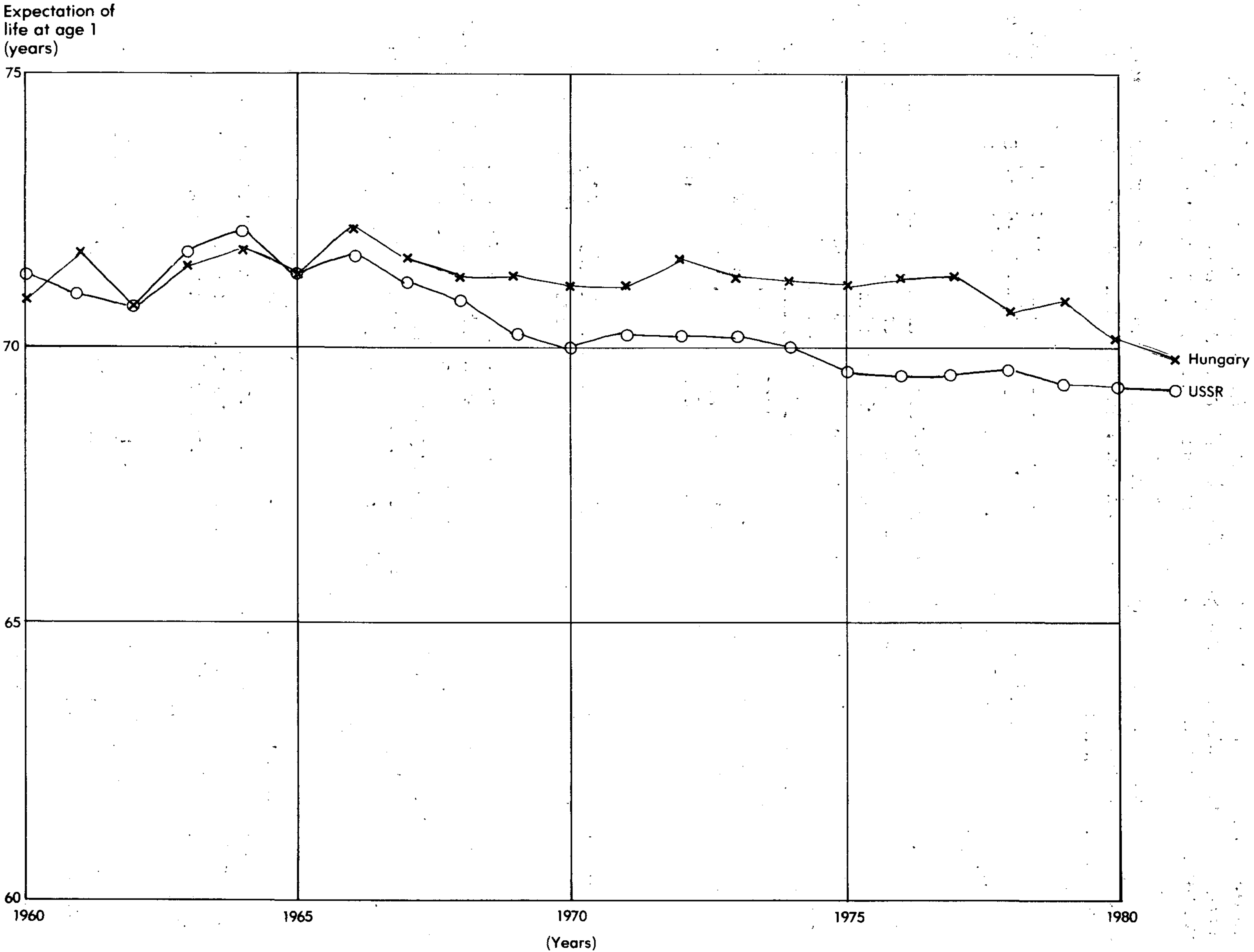
Source: See table 12.

according to table 11, it is in that country that the most marked deteriation of the population's health is observed. Since 1976, however, the USSR is no longer publishing age-specific life tables and only two life tables before 1976 are available for the periods 1958-1959 and 1970-1971. That is quite inadequate for the comparisons we want to make. 9/

For Eastern Europe comparisons are possible for four countries: Hungary, Poland, Czechoslovakia and the German Democratic Republic. These countries are shown in that order in figure VIII. Hungary is interesting because from the starting point, about 1960, to the end point, in 1980, it is close to the USSR (figure IX), so that the Hungarian trend for 1960-1980 must indicate fairly well what must have happened in the USSR. It can be seen from figure VIII that the deterioration in health applies chiefly to males. the deterioration is substantial. For the young man of 30, for example, life expectancy diminished by 0.7 years from 1960 to 1970 and by 2.1 years from 1970 to 1980. In the 20 years from 1960 to 1980 he has lost a total of almost three years (to be exact, 2.8). It will be noted that from 1970 to 1980 even women are affected by the process of deterioration. True, the fall in life expectancy under age 1 is slight, but in its general context that decline can be interpreted as an unfavourable sign. Poland follows the pattern of Hungary but the deterioration is less marked. It accelerates, as in Hungary, from 1970 to 1980. The acceleration is greater than shown in figure VIII. The turning point occurs about 1975, and the whole of the decline shown for the period 1970-1980 actually occurred between 1975 and 1980. The Polish young man of 30 lost 1.9 years from 1960 to 1980. Polish women stopped advancing in 1970-1980 and there was even a decline among adolescents. Czechoslovakia provides us with an example of a sizeable deterioration in male health from 1960 to 1970. Nothing of the kind is observed elsewhere. The decline in Hungary, for example, from 1960 to 1970 was small in comparison with the decline that followed between 1970 and 1980. Even Czechoslovak females were affected by the deterioration of health from 1960 to 1970. For 1970-1980 a slight recovery is observed for males under age 30, but the decline continues for males over age 30, although it is very slight in comparison with the period 1960-1970. For the period as a whole the deterioration is significant. A young man of 30 lost 2.8 years of life expectancy between 1960 and 1980 in Poland and 1.8 years in Czechoslovakia, that is, a little less than in Poland. For Czechoslovak women the recovery between 1970 and 1980 results in slightly positive gains over the period as a whole. The situation is the same as in Poland: stagnation in female life expectancy over age 1 from 1960 to 1980.

In the German Democratic Republic a slight decline in expectation of life after age 2 is observed from 1960 to 1970 but is wholly offset by a slight rise from 1970 to 1980. 10/ Overall, the health of males remained practically unchanged from 1960 to 1980. The slight decline observed from 1960 to 1970 was also observed in many other industrialized countries, such as the Federal Republic of Germany, as can be seen from figure VIII. What is surprising is the slight rise observed in the German Democratic Republic from 1970 to 1980, whereas in the neighbouring Federal Republic of Germany very significant gains were observed. To go back to our example of the young man of 30, from 1960 to 1980 he lost 0.2 years of life expectancy in the German Democratic Republic and gained 1.0 years in the Federal Republic of Germany. For women, gains are observed in both periods in both countries but the gains are higher in the latter than in the former.

Figure IX. Changes in expectation of life at age 1 from 1960 to 1981 in Hungary and the USSR



Source: See table 11.

Next in the figure after the German Democratic Republic comes the Federal Republic of Germany, which we have just commented on. The Federal Republic of Germany can be considered as fairly representative of all the capitalist European countries except those classified earlier as the vanguard and rearguard of the group. To go over the characteristics of the trend: for males, slight gains from 1960 to 1970 and even slight losses in certain cases, followed by significant gains from 1970 to 1980; for women, gains in both 1960-1970 and 1970-1980; the gains in the latter period were larger than those in the former.

Japan comes next in figure VIII. Gains are truly spectacular, in both periods. Gains for male life expectancy are particularly striking. This is what gives Japan the smallest excess male mortality among industrialized countries.

Finally, the graph shows Northern Ireland as an example of the rearguard of capitalist European countries and Sweden as an example of the vanguard. The movement in these two countries was fairly similar. For males there were few variations in the two periods considered. Despite the smallness of the variations, there was nevertheless a reversal of the trend for the rearguard countries on going from 1960-1970 to 1970-1980. Small gains in the former period are replaced by small losses in the second. For females, gains are observed in both periods in both countries. However, the gains for Sweden are larger than those for Northern Ireland, and in both countries, the gains for the period 1960-1970 were larger than those for the period 1970-1980.

Tentative conclusion on the deterioration of health in Eastern Europe and the USSR and on the improvement of health in the other European countries

We can now answer the questions asked earlier. The deterioration of health observed in Eastern Europe has occurred chiefly among men. The health status of women has not worsened but progrss has been small and in one case, Hungary, there has even been the beginning of a decline in the health status of women. Is this the beginning of a broader trend to come? In the Soviet Union mortality has probably followed the same trends, with an even more marked deterioration.

In capitalist European countries, with the exception of the vanguard and rearguard countries, there was a reversal of the trends for males on going from 1960-1970 to 1970-1980. In the former period there was little variation in mortality. In the latter significant gains are observed. Female mortality, in turn, declined in both periods and the decline accelerated between 1970 and 1980.

In the rearguard and vanguard countries male mortality changed little from 1960 to 1980. Female mortality declined, but the decline was slower between 1970 and 1980.

There remains Japan, where spectacular gains are an enigma to scientists.

Table 2. Deaths per 1,000 Live Births in Selected Countries

Age group	USA	13 Latin American countries
Neo-natal (first 28 days)	13	40
Post neo-natal (1-11 months)	5	40
Young child (12-60 months)	0.8	6

Source: Derived from Puffer and Serrano, Patterns of Mortality in Childhood, PAHO Scientific Publication No. 262, 1973, chap. IV.

Available measures, their coverage and impact

Depending on the priority needs for child survival in any particular area, the main measures to be considered are likely to be among those enumerated below, for which low-cost and acceptable technologies are available. Moreover, they are synergistic and can use a common system of access at the community level.

Growth monitoring (including monitoring during pregnancy)

Growth is a fundamental aspect of survival and development through pregnancy and the first five years of life, and its importance can be easily communicated. The two basic stages of growth require different interventions:

Low birth weight (LBW) is the first manifestation of inadequate growth, defined by WHO as below 2,500 grams at birth, with retarded foetal growth at term more frequent than prematurity. There are some 21 million LBW babies born in the world each year (one in six). Of the births in developing countries 18 per cent are LBW, compared with 7 per cent in industrialized countries. 8/ Neo-natal deaths account for half of infant mortality (see table 2) and their reduction depends much more on interventions benefitting women than on what can be done during the neo-natal period. These interventions for women, to be recommended on a

THE STRUCTURE OF A CHILD SURVIVAL PACKAGE

The problem

A description of the rationale for a "minimum package of services" or "child survival package" would require an extensive analysis of the causes and prevalence of infant and child mortality and morbidity. As this is not the place for such an undertaking, only a listing of the main causes of child death and of their frequence according to age is presented here, although reference will be made to the relevant literature (see annex).

Child deaths usually have multiple causes, as shown in the following breakdown. The components are found nearly everywhere, in orders of importance varying with ecological and socio-economic conditions.

Age group	Main causes of mortality
Neo-natal (0-1 month)	low birth weight (the main underlying cause), infection, birth traumas, tetanus
Post-neo-natal (infant) (1-11 months)	malnutrition, diarrhoea (the two main underlying causes), respiratory diseases, whooping cough (immunizable), malaria (if prevalent)
Young child (12-60 months)	malnutrition, diarrhoea, respiratory diseases, malaria (if prevalent), accidents, measles and other immunizable diseases - malnutrition and diarrhoea still the two main underlying causes but immunizable diseases also important.

Table 2 illustrates death rates for three basic age groups in the Americas from 1968 to 1972, compared with the United States.

In poorer countries, these rates are even higher than those presented in table 2 for the 13 Latin American countries. In general, half of all infant deaths occur in the first month of life. Young-child deaths amount to a further 40 to 50 per cent of deaths during infancy.

at the disposal of the communities and its properties and financial implications clearly illustrated to them. Obviously this is an educational process which will take time to materialize. In addition, there are risks involved, as the existing power structure at the village level may attempt to manipulate the poor in order to maintain the status quo and to benefit from the new flow of resources reaching the communities. Despite these risks, experience has shown that when communities have been genuinely involved in the surveying of their needs, as well as in the design and implementation of packages aimed at improving health and resources, results have been quite successful in terms both of impact and of cost-effectiveness.

Finally, while technical expertise and cost considerations are certainly contributing factors in determining an optimum selective package, community participation is probably one of the major preconditions for its success.

UNICEF'S PRIORITY INTERVENTIONS

In UNICEF the debate over the choice of an optimum package of interventions has not passed unnoticed, particularly in the last few years when the protracted stagnation-recession of the world economy has led to falling family incomes, to a reduction of budgets for health services, child welfare and food subsidies and to stagnating aid flows. These disturbing trends might, it is feared, contribute to a further slow-down of the mortality decline observed in the 1970s and, in the worst cases, to a reversal. UNICEF has responded by distilling the lessons of its 36 years of experience. The overall conclusion is that the deepening of the present crisis is now being matched by emerging opportunities on an equal if not greater scale.

UNICEF's main message (forcefully presented in the State of the World's Children Report 1982-83), 7/ is that there is a minimum package of services (accompanied by support measures), which is low-cost, low-risk, low-resistance and capable of significantly improving child survival, quality of life and development even in periods of grave financial difficulties. In many countries a number of these measures are already being applied. The need now is to accelerate their extension.

UNICEF advocates that such steps be taken with a long-term view. Most would fall within the framework of primary health care in its broad interpretation - extending when necessary beyond the health sector to include measures in the domain of social affairs, education, agriculture, water resources, rural development and income-generation. "Crash programming" in the sense of a short-term programme designed only for the current financial emergency is not advocated, nor is the creation of single-service "vertical" programmes. Rather, the aim is to help Governments accelerate primary health care implementation.

UNICEF co-operation has always focused on child survival and development. In the current economic crisis, this focus should become sharper, based on more rigorous analysis of harder epidemiological and cost data and on greater community involvement and responsibility in order to generate greater political commitment and to make services more cost-effective.

Three points may be instrumental in breaking this apparent stalemate. First, as amply proven, high morbidity and mortality are the result of "vicious circles" in which infection, illiteracy, malnutrition, etc. tend to be mutually reinforcing. If this is the case, a simultaneous attack on all these factors is required. Secondly, in the designing of a programme, attention should be given to the linkages between those interventions which are particularly synergistic, so as to set in motion a "virtuous circle" of positive mutually reinforcing effects. Thirdly, since resources are limited, setting priorities among different types of interventions is required, without forgetting, however, the need for an integrated approach and the strong linkages existing among some interventions.

If some degree of priority is accepted in principle, how can one proceed to identify the set of most cost-efficient measures feasible under certain resource constraints? Or, more generally, is it possible to identify packages of priority interventions?

Several studies exist which evaluate the impact of specific interventions. These studies, a few of which have been mentioned above, normally are carried out for limited areas and try to isolate the effect of each intervention by controlling the influence of other potentially intervening factors. A recent interesting study 4/ proposes a general methodology for tackling this problem by developing an optimization model intended to provide policy-makers with an analytical framework to facilitate the efficient allocation of resources to programmes aimed at reducing child mortality. While the model is used to provide a direct assessment of health interventions, the approach is intended to have general application for the analysis of the cost-effectiveness of alternative programmes. At the core of the approach is a multiple disease morbidity-mortality model that makes it possible to estimate the disease incidence and mortality levels that result from a given policy intervention. Although still in a preliminary stage, this approach appears quite promising for answering the question how to choose an optimum package. Further research along these lines could provide additional elements to the solution of the problem under discussion.

Similarly, the World Health Organization (WHO), while endorsing the goal of "Health for All by the Year 2000", has begun to establish priority objectives by concentrating on short-term efforts to promote selected interventions with the highest health impact under existing conditions. 5/ Another recent effort tries to assign priorities (high, medium, low) for disease control in developing countries, using the criteria of prevalence, mortality, morbidity and feasibility of control. 6/ There will doubtless be disagreement over the ranking of disease control efforts, but this general framework should provide a methodology by which alternative priorities can be advocated and justified.

An interesting approach to setting priorities (which is integral to primary health care and the basic services philosophy of the United Nations Children's Fund (UNICEF)) consists of relying for these decisions on the concerned communities themselves. They have the best knowledge of what their 'perceived needs' are, of the order in which they should be tackled and of the administrative and managerial arrangements which are the most suitable for solving their problems at the local level. Technical knowledge should be put substantial social and economic change. The recent reassessment of the experience of countries like Sri Lanka, China, Taiwan, Cuba and the Republic of Korea suggests, however, that the causes of mortality decline are much more complex and that other factors played a major role in reducing mortality.

Recently some authors have gone as far as claiming that "... child survival is primarily determined by the social and economic resources in the child's family. Analytically, these family resources may be largely captured by two indicators - maternal education and some index of the economic circumstances of the household. Any social and economic differentials between individual families will almost certainly be directly manifested in differential survival of their children. Thus the correlation between child survival and indicators of social equity are likely to be quite direct. ... while certain modern Western technologies like antimalarials seem to have had an impact on mortality ... for all practical purposes it has been virtually impossible to measure any impact of the existing formal medical system as an independent variable." 1/

Several other studies focusing on mortality differentials indicate that education, and in particular maternal education, appears to be the most powerful determinant of the level of child mortality, after controlling for differences in income level and other possible explanatory variables. For instance, a recent survey of the literature summarizing 24 research findings in 15 countries showed that in three quarters of the cases analysed infant and child mortality declined unequivocally as educational levels increased. 2/

Another recent paper examining possible approaches to mortality reduction concludes that, besides specific interventions in the areas of health, education, environmental improvement and nutrition, the pace of economic and social progress is likely to be significant for mortality improvements. Even if this progress adheres to a traditional growth-oriented path, "... as progressively higher levels of development are reached, changes in the availability of resources and the structure of their use interact with one another in ways that influence and are influenced by alterations in mortality levels". 3/ However, the same paper points out that equally important results can be achieved in a much shorter time by the implementation of redistributive policies which would enhance the resource base of the poorer groups in society, among which mortality is the highest.

SETTING PRIORITIES AMONG INTERVENTIONS

Even this very cursory review indicates that while there is broad agreement on the positive effects on mortality of these various approaches, opinions vary substantially on their relative importance and on the policy-mix and composition of the package which can most efficiently tackle the mortality problem.

(4) A careful analysis further reveals that the slow-down in infant and child mortality reduction has been much more drastic than that in older age groups. This contrasts with the historical experience of Europe, where the greatest gains in overall mortality decline were generally recorded for infant and child mortality.

In brief, developing country mortality declines appear to have become more fragile, while the gains have become increasingly concentrated in a limited number of areas. The question of the pace and pattern of future progress, however, remains largely an open question. Much will depend on the broad political support that such objectives will receive nationally and internationally, as well as on the efficiency of the measures and interventions to address the mortality problems.

APPROACHES AND LINKAGES

Planning for mortality reduction requires a clear understanding of the complex cause-effect interactions between, on the one hand, mortality and, on the other, broad-based socio-economic development and specific interventions in such areas as health, nutrition, sanitation and education.

Poverty, poor health and high mortality are the results of mutually reinforcing and synergistic causes such as low income, insufficient food intake, illiteracy, poor environmental conditions, infection, disease and lack of water and sanitation. It is therefore illusory to attempt to improve health and reduce mortality through a single intervention. Potentially, all the components of a basic need intervention can make significant contributions to the achievement of good health and a low level of mortality. Improved agriculture (or, more broadly, better employment opportunities) increases people's food entitlements and, consequently, nutrition. Better transportation contributes to the reduction of food losses and decreases isolation and ignorance. Improved housing and water supply decrease overcrowding and the spread of communicable diseases. Health services contribute to the control of infections and communicable diseases. Basic education increases understanding of child-rearing, personal hygiene and causes of disease, as well as improving productive skills. Child spacing improves the probability of survival while reducing pressure on scarce resources. Mass media help diffuse knowledge and ideas.

However, while there is widespread agreement that all those factors have an impact on health status and mortality levels, views tend to differ on their relative importance and on which are the most direct and efficient ways to tackle the problem.

Many specialists during the 1950s and 1960s believed that the introduction of medical and health technology from the industrialized countries was the main factor in the rapid mortality decline observed in those years. It was further believed that these medical and health-related interventions would achieve dramatic results even in the absence of development if the right policies are implemented. At present, however, the examples set by these nations are not being replicated in any significant manner by those countries where high IMR and low life expectancy still prevail, although in most of them some possibilities for action do exist.

(3) The analysis of historical trends over the last 20 to 30 years yields another potential warning signal. Indeed, there are indications that the observed rapid decline in mortality rates has begun to falter in many areas. Data inadequacies render difficult any unqualified statement on the development of the last few years. According to recent figures prepared by the United Nations, however, the pace of progress has slowed in the third world as a whole and in each of its three principal regions. Life expectancy, which had been rising by 0.64 years annually in the 1950s, increased in the 1970s by only 0.40 years. Similarly, there has been a slow-down in infant mortality decline, as clearly illustrated in table 1. Although the progress in reducing infant and child mortality is still a respectable achievement, the slow-down is surprising. It has occurred much earlier than predicted on the basis of the European experience and at a time when the prevailing levels of mortality in most countries are still high.

Table 1. Decline in infant mortality rate over five-year periods

Region	1950/55 to 1955/60	1955/60 to 1960/65	1960/65 to 1965/70	1965/70 to 1970/75	1970/75 to 1975/80
Africa	12.0	12.0	10.9	10.9	10.4
Latin America	13.6	12.5	10.1	9.9	10.4
East Asia	24.2	22.6	18.0	14.8	10.7
South Asia	16.5	14.9	11.6	11.1	7.8
Overall	18.2	15.6	12.9	11.1	6.1

Source: Calculated from Population Division, Department of International Economic and Social Affairs, United Nations Secretariat, "Infant mortality: world estimates and projections, 1950-2025," Population Bulletin of the United Nations, No. 14-1982 (United Nations publication, Sales No. E.82.XIII.6).

B. New hope in dark times: an assessment by the United Nations Children's Fund of a child survivial package: its effectiveness and its social and economic feasibility

G. A. Cornia*

INTRODUCTION

Despite the recurrent lamentations dominating most of today's literature on third-world health conditions, there are few doubts that over the last 30 years health and sanitation have improved rapidly and substantially throughout the developing world. Recent figures published by the Population Division of the United Nations show, for instance, that an overall health indicator such as infant mortality rate (IMR) declined from 164 in 1950-1955 to 91 in 1980-1985 for the developing world as a whole. Similarly, life expectancy at birth increased from a low of 42.6 in 1950-1955 to 58.5 in 1980. The improvement has been particularly rapid in a few Asian and Latin American countries, where the rate of progress has been unprecedented by any standard. Although the results so far can be considered highly encouraging, the solace they offer is limited on at least four counts:

(1) The figures given above represent regional averages and conceal a wide variety of experiences: some very successful, others not at all. In Indonesia, for instance, IMR was around 150 and 93 for 1960 and 1980 respectively (with an implied average rate of reduction of almost three points per year). In Bangladesh, IMR for the same years was 159 and 136, with a very modest rate of reduction. As in the case of development in general, some countries, or parts of countries, have experienced very slow progress. There is the distinct possibility that, overlapping with the group of least developed countries, a "fourth world" which continues to experience little or no social progress is gradually emerging. Without dramatic shifts from the present situation, disparities between and within nations will continue to be shockingly large.

(2) Although the overall progress in developing countries has been indeed impressive even when compared with the European experience, the gains are still modest if viewed in relation to the improvement that should be possible on the basis of present scientific knowledge and available financial and human resources. The experience of countries such as Sri Lanka, China, Taiwan and the Republic of Korea and the state of Kerala in India has shown that comparatively low rates of infant mortality and high life expectancy can be attained at even a low level of economic

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*United Nations Children's Fund

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These examples can be of assistance in guiding the discussion at this meeting along five major themes:

Data bases

The need for adequate data is of prime importance in the understanding of morbidity/mortality processes. Apart from national level census and survey approaches, the establishment of a few "small areas" of the Matlab type should be envisaged. Further, cross-sectional survey methods should be supplemented by anthropological case-study approaches that would enhance interpretation of data in widely differing cultural settings found in developing countries.

Conceptual framework

The understanding of mortality/morbidity processes and the effective selection of health strategies within developing countries requires the development of a conceptual framework. Such a framework should include the intermediate level variables at the individual and household levels but should be integrated within a national and even an international setting.

The efficacy of health and social intervention

Based on an appropriate conceptual framework, health policies should be selected that optimize solutions within sets of constraints - financial, cultural or political. Realistic targets for each country should be set.

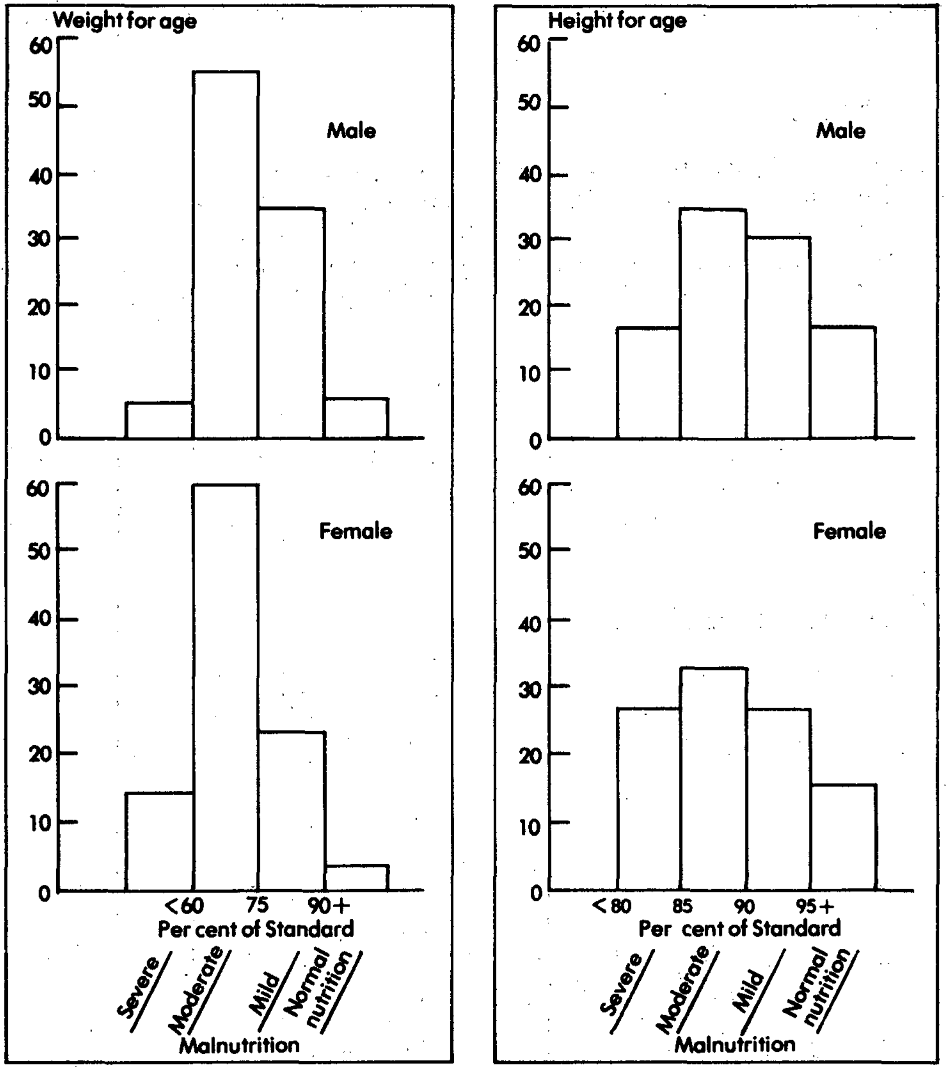
The cultural and social context

To be effective, health policies should be adapted to suit the cultural and social heritage of particular countries. Appropriate technology - understood in not only a technical but also a cultural sense should be aimed at.

Political will

In most developing countries social inequities exist which militate against improvements in health and mortality levels. Political will at the highest levels of government to eradicate such inequities is of prime importance to the development of successful health strategies. Some areas such as drug policies may in fact require international awareness and co-operation.

Figure V. Distribution of 882 children by sex according to nutritional status as defined by weight-for-age and height-for-age anthropometry, Matlab, Bangladesh



respiratory diseases and measles - have been singled out because of their relevance and the reasonable likelihood of accurate identification. For infants, tetanus appears to account for about a quarter of all deaths. Respiratory and diarrhoeal diseases are next in importance. Sex differentials with regard to cause of death do not appear significant during infancy. Since tetanus is presumably the result of unhygienic treatment of the umbilical cord during the neo-natal period, the lack of a strong sex differential for this cause of death is not surprising. For the age group 1 to 4 years, diarrhoeal diseases, respiratory diseases and measles are the most important causes of death.

Remedial policy measures against these major causes of infant and child mortality should be a high priority of any health programme in developing countries. In the Matlab area a health intervention project, consisting of major family planning inputs as well as education of mothers in nutrition and child care, has been shown to reduce not only fertility but also mortality. 5/ The unique Matlab setting has also been the site of evaluation of immunization and oral rehydration programmes. Neo-natal mortality rates of children of mothers who had been fully immunized with tetanus toxoid during pregnancy were only half as high as those of children whose mothers had not been immunized. 6/ A large-scale field trial of oral rehydration use by patients suffering from diarrhoea has shown that mothers can be trained to prepare and use oral rehydration solutions with locally available ingredients and that such a method can be as safe and effective as the use of packet solutions based on proportions of electrolytes recommended by the World Health Organization. 7/

Mortality and morbidity processes are complex and the assignment of a single cause of death may mask this fact. In countries with low economic development malnutrition is often an underlying cause of death. A recent Matlab study has documented that the existence of malnutrition as well as sex differentials in mortality can be attributed to inequitable food allocation within families. 8/ Figure V shows data from this study on 882 children. Using the Harvard weight-for-age standard, 14.4 per cent of female children were classified as severely malnourished, but only 5.1 per cent of males. The percentage of moderately malnourished girls (59.6) exceeded that of boys (54.8). In the normal and mild categories of nutritional status the proportion of males exceeded that of females.

The material presented thus far indicates the need for a conceptual framework for the study of mortality. Mosley has distinguished two types of synergy inherent in the mortality/morbidity process -- biological and social. 9/ He describes a conceptual model with five intermediate variables covering social and biological components: maternal fertility factors, environmental exposure, nutrient availability, personal disease control factors and injuries. These variables have been set at the individual and household levels. While such a framework has an important role in the understanding of mortality, there is clearly a need to ensure the insertion of the individual or household variations into community and macro structures which also have a major significance. Many social and cultural inequities can be corrected only by political intervention. In developing countries the political will to change conditions is often lacking. The existing power structure may not be convinced of or may even resent improvements of education, for instance, with all the repercussions this could have in terms of increased awareness of social rights.

Table 1. Infant (0-11 months) and early childhood (1-4 years) mortality by sex and major causes of death in Matlab, Bangladesh, 1975-1977

Cause of death	Sex	Infant deaths		Child deaths	
		Number	Per 1,000 live births	Number	Rate per 1,000 population
Tetanus	Both sexes	1174	37.42	59	0.60
	Male	599	37.26	30	0.59
	Female	575	37.59	29	0.61
Diarrhoeal diseases	Both sexes	91	2.90	153	1.55
	Male	50	3.11	67	1.32
	Female	41	2.68	86	1.80
Respiratory diseases	Both sexes	328	10.45	160	1.62
	Male	163	10.14	66	1.30
	Female	165	10.79	94	1.96
Measles	Both sexes	96	3.06	440	4.46
	Male	45	2.80	194	3.82
	Female	51	3.33	246	5.14
Others	Both sexes	2352	74.96	1992	20.19
	Male	1180	73.39	824	16.24
	Female	1172	76.62	1168	24.39
All causes	Both sexes	4041	128.80	2804	28.43
	Male	2037	126.69	1181	23.27
	Female	2004	131.01	1623	33.89

Source: D'Souza and Chen.

Figure IV. Mortality rates (1974-1977) of children aged 1 to 4 years by education of household head

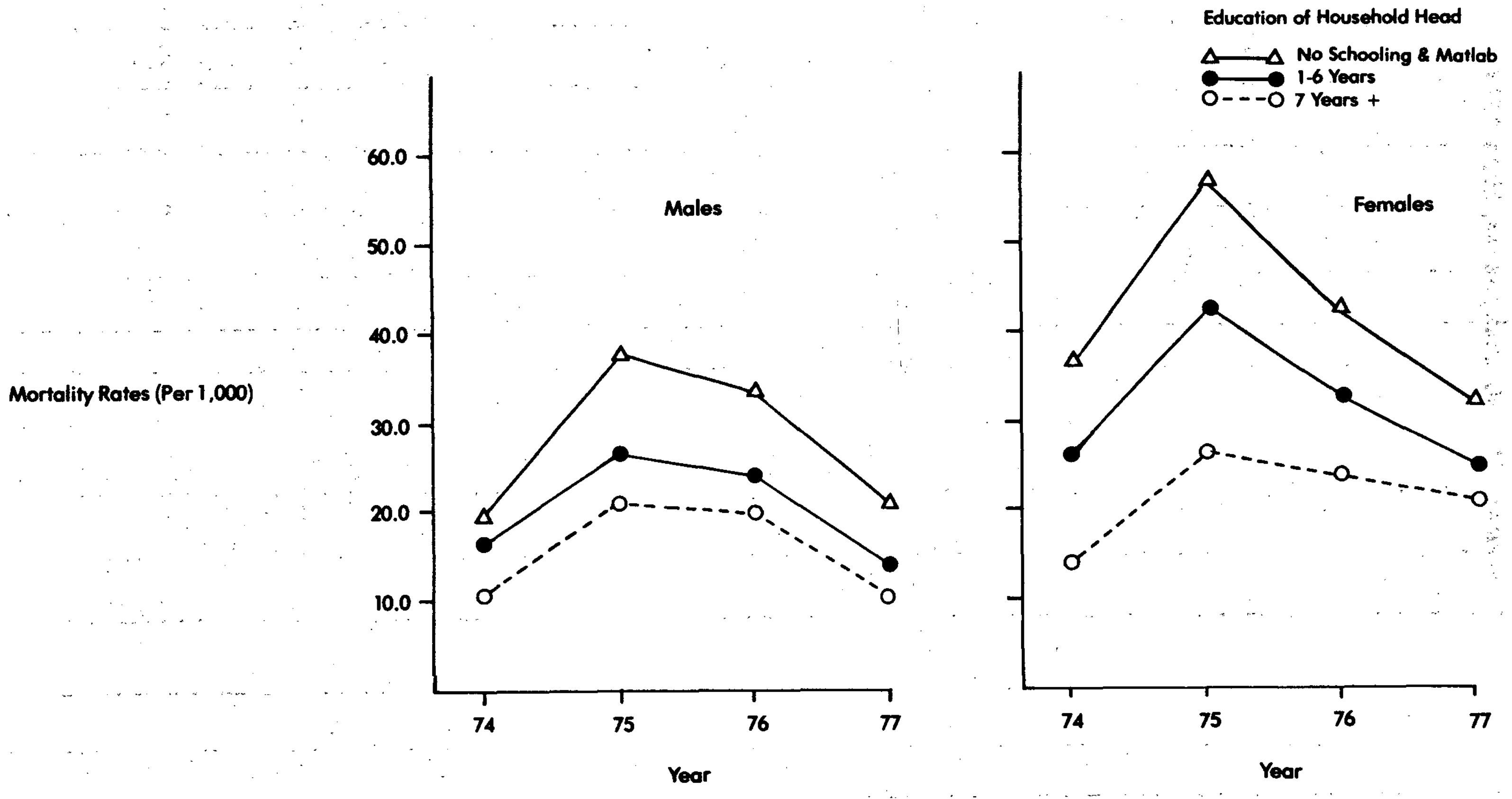
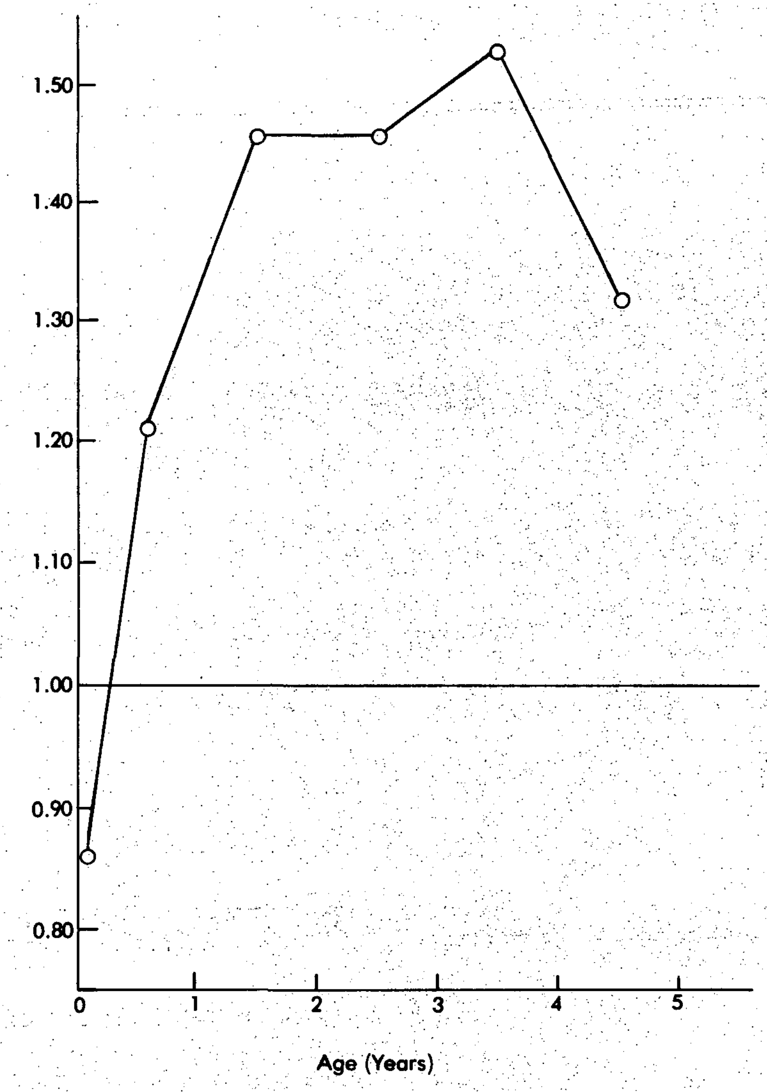
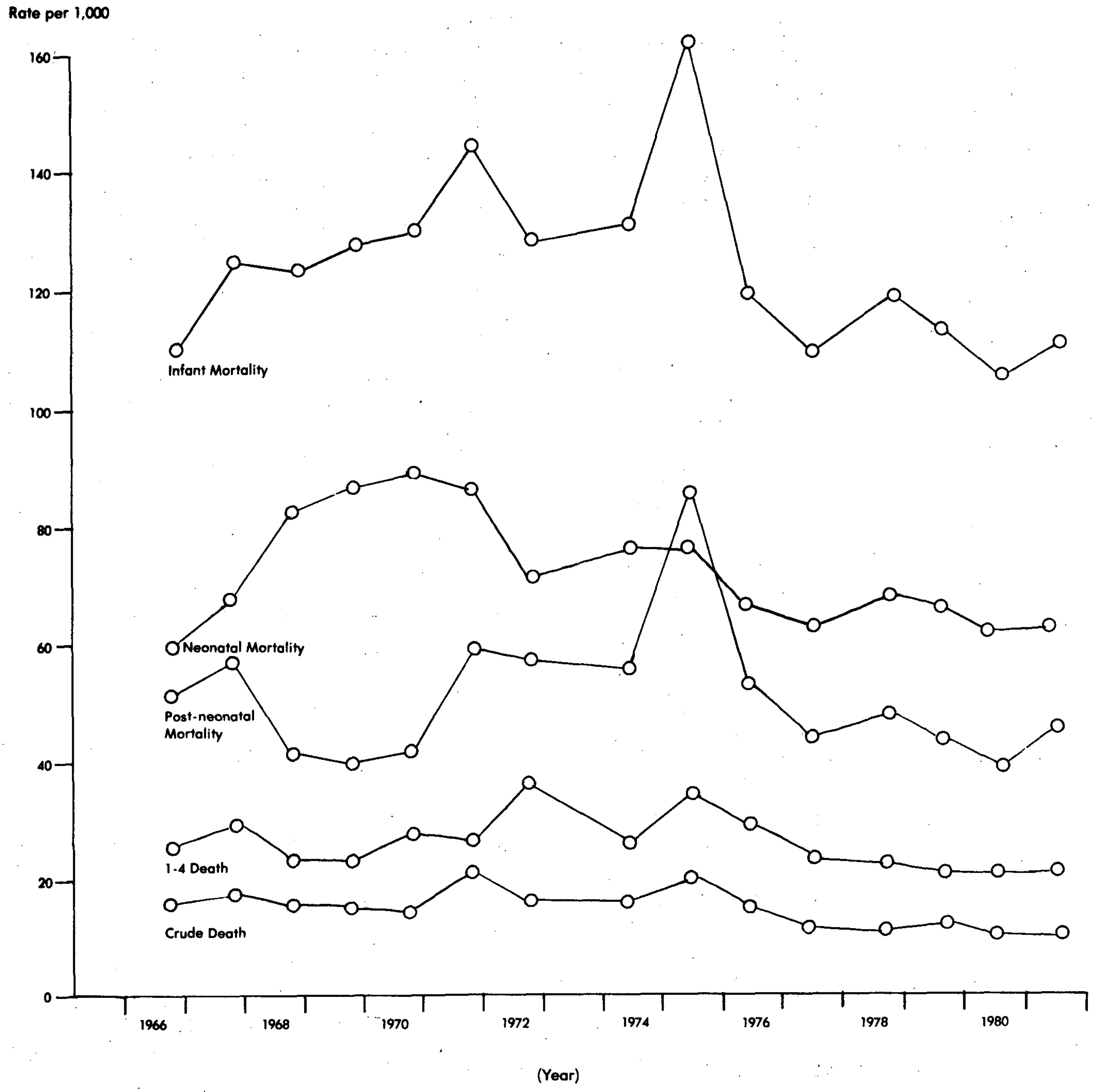


Figure III. Rate of female to male mortality rates for children under five years in Matlab, Bangladesh, 1974-1977



Source: D'Souza and Chen (1980)

Figure II. Infant (neonatal and post-neonatal) mortality rate, child 1-4 year death rate, and crude death rate in Matlab, Bangladesh (1966-1981)



There may also be some slippage towards the 10-15 age group resulting from the initial start in 1966. The enumeration census results portray the saw-tooth picture consequent on age heaping at the zeros and fives, fairly common in census data from developing countries.

Through the use of stable population theory, the crude death rate for Bangladesh has been estimated at 19.4 per thousand for the 1961-1974 period. A longitudinal series of mortality rates in the Matlab area for the period 1966-1981 is presented in figure II. The overall crude death rate has been fairly constant - just under 17 per thousand prior to 1974. This result is consonant with the indirect estimate. However, infant and child mortality rates demonstrate the fragile nature of the mortality equilibrium. Peaks are noted during the periods 1971 and 1974-1975, reflecting the unsettled conditions in the country during the liberation struggle and famine respectively.

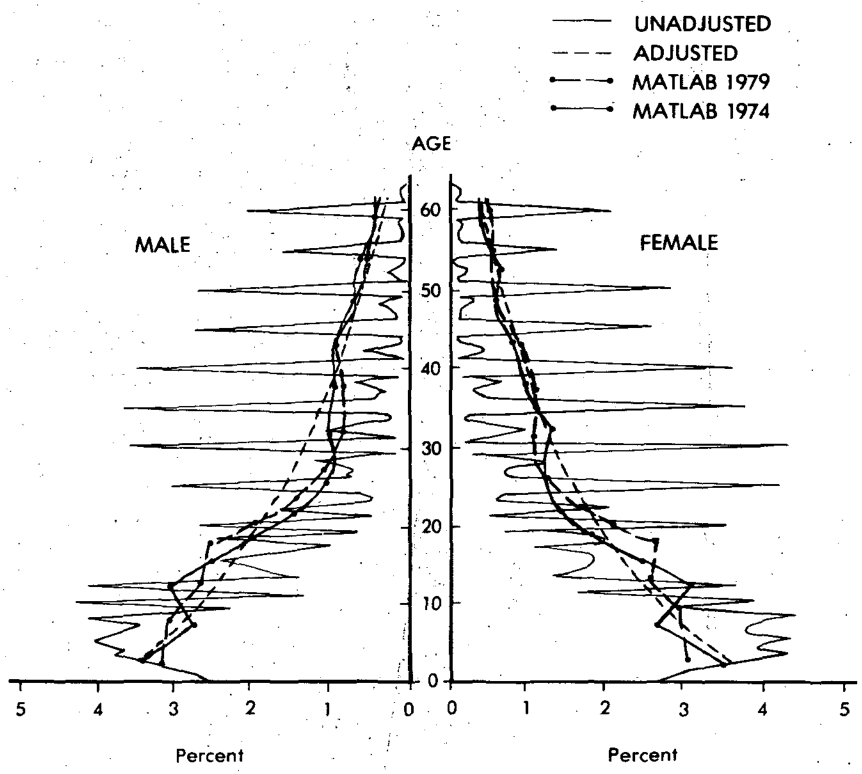
Levels and trends alone do not provide an adequate picture of mortality in a particular country. The study of mortality differentials is necessary to frame health policies that would reduce within-country inequities. Some inequities may reflect cultural biases while others may be associated with socio-economic parameters. Data from the Matlab area have documented both sex and socio-economic differentials in mortality.

Figure III depicts the direction and magnitude of sex differentials in mortality for children under age 5 for 1974 to 1977. The ratios for female to male mortality at specific ages are plotted. Male mortality exceeds female mortality only during the neo-natal period. Thereafter, female mortality exceeds male mortality by increasing amounts up to age 3 years, when female death rates are 46 to 53 per cent higher than the corresponding male rate. The ratio declines in the fourth year of life. 2/

Figure IV presents mortality rates in early childhood by education of household head. Three levels of education have been considered: persons with no schooling or with religious education only, those having completed one to six years of schooling, and those having completed seven years or more of schooling. At all three educational levels, there is a peak in mortality rates for 1975, while 1977 rates are fairly similar to those of 1974. Considering mortality for particular years, one notices markedly lower death rates with increasing education. The ratio of mortality rates at the lowest education level to the highest (I:III) exceeds 1.70 in each of the four years, although a slight decline in this ratio is noticed with time. Of note too are the higher levels of female mortality and the fact that during the crisis year of 1975 the mortality rate at the lowest educational level was nearly 40 for male and over 50 for female children. 3/ Caldwell has shown that education of mothers is an important predictor of mortality levels. 4/ Similar results have been documented in Matlab.

Specific health interventions to reduce mortality can be specified only if reliable information on cause of death is available. Much valuable data have been generated by the surveillance system in Matlab though there are serious limitations to the classification procedures used. Improvements are now under way. Table 1 presents data on infant and child deaths for the years 1975 to 1977. A few important causes of death - tetanus, diarrhoeal diseases,

Figure I. Percentage distribution of unadjusted and adjusted population of Bangladesh 1974 with mid-year population of Matlab -1974 and Matlab-1979



III. IMPLEMENTATION OF HEALTH POLICIES

A. Introductory remarks on health policies and their effects on mortality in developing countries

Stan D'Souza*

There is widespread recognition that mortality levels in developing countries have ceased to fall in several regions of the world in spite of earlier optimism that technological advances in the health area would result in reduced mortality rates. As one of the topics to be considered by the Expert Group at this meeting, "Health policies and their effects on mortality", is quite general, some focus would seem appropriate. Selected data from the Matlab area of Bangladesh can be of assistance in highlighting the problems related to the understanding of mortality in developing countries and the consequent setting of remedial policies in the social and health areas to lower mortality rates. The International Centre for Diarrhoeal Diseases Research, Bangladesh (ICDDR,B) has operated a field station in that rural area since 1963. Demographic surveillance has been maintained since 1966 and at present 149 villages, comprising a 1982 population of about 180,000, are covered. A large volume of unusually reliable data has been generated over the past decade. Apart from demographic data, several studies conducted in the area on diarrhoeal diseases and related topics also provide important information on mortality and morbidity processes.

In many developing countries where vital registration systems are defective or non-existent, mortality levels are estimated from census data or indirect estimation techniques.

Figure I shows the percentage distribution at various age groups of the enumerated census population of Bangladesh for 1974 (unadjusted) with corresponding values from model life tables (adjusted). West model life tables were utilized - the selected levels being 12.14 for males and 10.8 for females. 1/ Superimposed on this graph are the percentage age distributions for Matlab for the years 1974 and 1979. One notices the fair similarity between the model curve and the actual data for Matlab. The broad base of 1974 Matlab data follows the natural pattern. In 1979 the signs of fertility reduction in Matlab, manifested by the narrowing base of the figure, are noticeable. It is interesting to note in the Matlab data that the excess in the 10-15 age group in the 1974 data moves over as expected to the 15-20 age group in 1979. The presence of large discrepancies within certain age groups is probably caused by migration (males in the 20-35 age group, for instance).

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9/ Roland Pressat's calculations would take us up to 1976, but he has published only expectations of life at birth and in any case 1976 is too far removed from 1980, our benchmark.

10/ In fact, the graph runs from 1970 to 1979, not to 1980. At the time of writing, 1979 was the last year for which life expectancies were available for the German Democratic Republic.

11/ World Health Statistics Quarterly, vol. 35, No. 1, (1982).

12/ The date for Czechoslovakia stop at 1975; there are two curves: for six countries and for five countries.

13/ Italy's and Belgium's data were not available for 1977; there are two curves, representing 13 countries and 11 countries.

could be the start of a sharper rise because of the fact that the statistics published by WHO, since they stop in 1977, do not completely reflect the acceleration in the deterioration of health observed in Eastern Europe since 1975. To consider a group covering all diseases other than cardio-vascular disease is obviously inadequate. These diseases must be divided into at least three groups, using the system described earlier: infectious and parasitic diseases, cancer, and violent deaths. It is because WHO publications made it possible to study the group of "other diseases" as a whole without the need for further calculations that we prepared tables 15 and 16. The organization is to be congratulated on having taken this step. It has saved us considerable labour. For dividing the group of causes other than cardio-vascular diseases into three, detailed data are provided in WHO's yearbooks, but the process of classifying them into three categories and calculating standardized rates is too burdensome for the individual researcher - or at least would take too much of the time available to him. We have therefore confined ourselves to this brief survey of causes of death in the hope that WHO will continue, for other causes, the work it has done for cardio-vascular diseases.

Notes and references

1/ J. Bourgeois-Pichat, "Un calcul approximatif rapide de l'espérance de vie à la naissance à partir du taux brut de mortalité", Population, vol. 21, No. 6, (November-December 1966), pp. 1123-1134.

2/ There are two age groups, but the sum of their proportions equals 1, so that c(a) becomes a single coefficient.

3/ In this calculation infant mortality is assumed to be the same in the year considered and the previous year. The fact that this assumption is unverified has no appreciable effect on the results.

4/ M. de Saboulin, "Données de démographie régionale, 1975", No. 388 in Collections de l' Institut national de la statistique et des études économiques (INSEE), Series D., No. 82, Démographie et emploi, (August 1981).

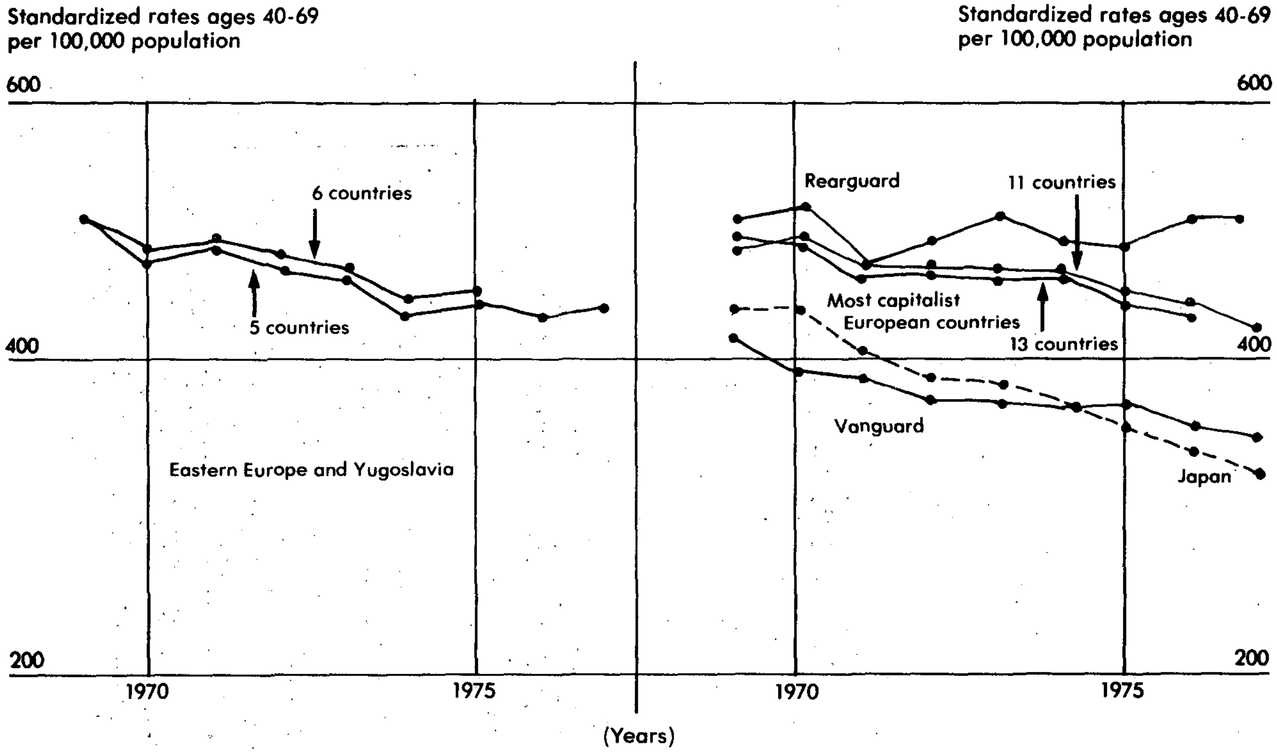
5/ Demographic Yearbook, Special Issue, Historical supplement, (United Nations publication, Sales No. E/F.79.XIII.8).

6/ The Japanese year runs from 1 March of a given year to 1 March of the following year. It therefore does not coincide exactly with the year of the Gregorian calendar. The year 1 March 1980 - 1 March 1981 has been assigned to the Gregorian year 1980 in table 3.

7/ R. Pressat, "Situation démographique de l'URSS à la veille de son cinquième recensement" (Demographic situation in the USSR as its fifth census approaches), Population, vol. 34, No. 4-5, (July-October 1979), p. 857.

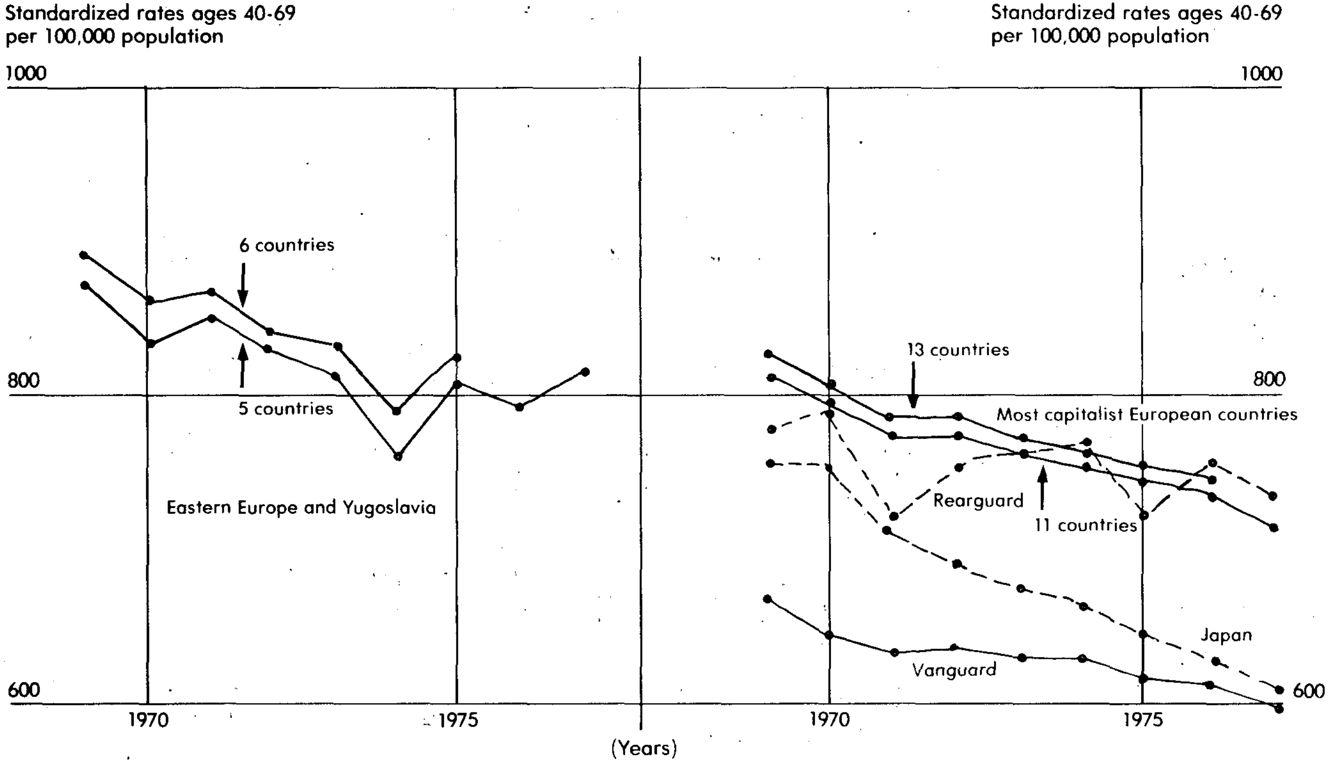
8/ Ibid.

Figure XIII. Standardized death rates at age 40-69 years for diseases other than cardiovascular diseases in some groups of European countries and Japan, 1969-1977, females



Source: See table 13.

Figure XII. Standardized death rates at age 40-69 years for diseases other than cardiovascular diseases in some groups of European countries and Japan, 1969-1977, males



Source: See table 13.

Table 16. Standardized death rates for ages 40-69 years for diseases other than cardio-vascular diseases in 27 countries, 1968-1977, females

(Rates per 100,000 population)

Country	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Bulgaria	398.5	427.4	386.9	400.7	395.9	370.9	357.3	386.5	368.1	367.1
Czechoslovakia	470.9	480.5	490.2	473.6	465.7	468.2	464.3	443.2		
Hungary		454.4	457.4	474.5	451.6	473.8	463.8	481.4	498.5	490.1
Poland		492.3	469.8	477.6	444.7	439.8	430.2	437.4	432.5	436.0
Romania		449.2	430.0	432.2	404.9	444.6	397.6	403.8	397.5	416.0
Denmark		490.9	493.5	492.2	500.2	477.5	466.0	473.2	492.2	465.3
Findland		405.6	386.1	377.2	363.7	347.3	363.8	363.4	339.9	401.5
Ireland	509.0	516.2	548.1	488.6	513.3	513.1	514.4	446.0	491.1	470.6
Norway		377.0	348.9	334.6	343.4	344.6	329.7	347.1	343.0	329.0
Sweden		398.4	381.8	365.4	368.9	361.4	371.9	367.2	363.1	361.3
England and Wales	450.8	472.4	457.0	442.3	455.9	447.7	447.3	443.1	450.2	433.8
Northern Ireland	461.4	464.4	479.7	420.7	450.9	480.4	448.6	448.9	450.2	467.2
Scotland	491.2	513.2	505.0	476.7	503.7	495.2	509.9	492.5	511.5	497.6
Israel								435.5	427.8	432.0
Italy	422.9	448.1	421.8	408.3	409.4	405.9	382.4	386.0	374.5	
Yugoslavia	541.0	585.9	552.1	532.9	575.7	500.2	467.2	460.0	429.8	432.4
Austria		506.7	509.7	481.3	474.8	463.5	462.3	457.6	443.6	440.1
Belgium	490.0	500.4	493.3	480.4	484.1	471.6	457.7	473.3	396.5	
Germany, Federal Republic of	525.3	540.8	518.8	503.0	498.3	545.4	484.0	482.7	471.6	450.5
France	477.2	495.7	453.8	452.5	451.1	437.1	431.5	427.5	418.2	398.7
Netherlands		422.8	407.6	401.2	393.9	385.7	373.3	374.9	367.3	364.0
Switzerland		447.2	428.9	420.4	402.1	401.6	382.1	361.6	357.7	346.0
Japan	440.2	431.5	431.8	405.1	387.3	382.1	371.3	357.9	341.4	329.6
Canada		426.5	423.2	409.1	426.8	425.3	418.1	413.3	401.1	400.3
United States	478.6	473.2	472.5	461.6	463.5	461.8	451.0	438.7	438.6	434.8
Australia	414.3	414.2	430.8	411.7	408.5	406.9	417.9	383.5	390.3	380.7
New Zealand	434.0	444.3	464.1	428.4	430.8	427.2	449.5	429.2	443.3	457.9

Source: See table 13.

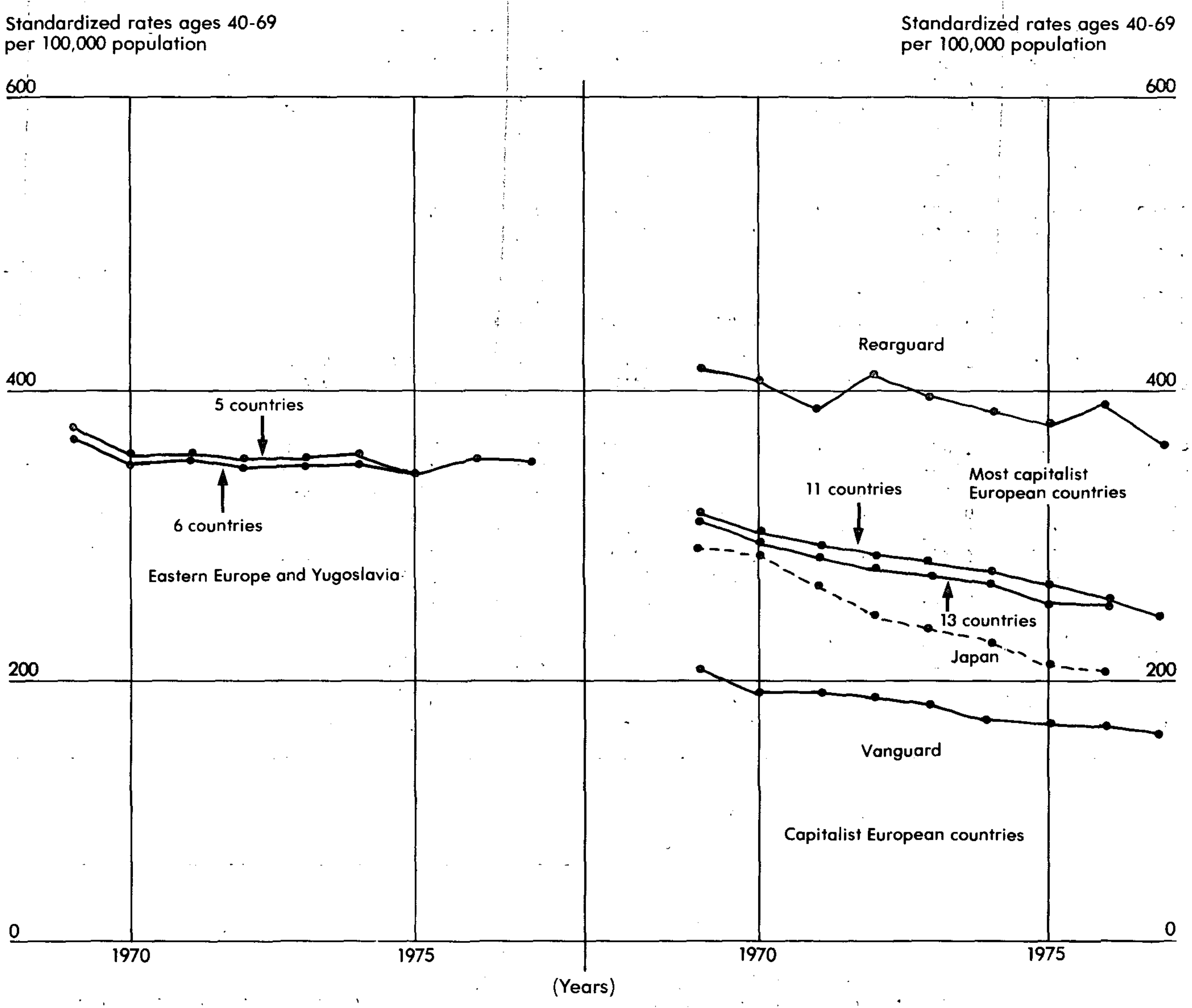
Table 15. Standardized death rate for ages 40-69 years for diseases other than cardio-vascular diseases in 27 countries, 1968-1977, males

(Rates per 100,000 population)

Country	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Bulgaria	718.4	794.8	709.4	768.0	729.9	689.0	689.6	721.3	683.0	721.7
Czechoslovakia	912.2	953.0	960.8	946.9	898.8	933.9	935.0	904.6		
Hungary		785.8	806.3	830.9	791.3	802.9	791.8	870.1	861.4	874.6
Poland		928.9	909.3	954.5	850.8	866.1	835.5	871.9	899.2	918.3
Romania		818.9	778.4	775.1	739.9	778.5	727.2	734.3	734.9	754.8
Denmark		653.3	656.8	678.7	694.1	671.3	666.8	633.9	658.2	623.7
Findland		928.0	857.9	890.4	833.4	813.3	831.0	794.5	785.2	775.2
Ireland	732.8	751.3	771.1	704.1	730.3	706.2	712.5	685.8	682.4	654.5
Norway		582.3	570.0	545.9	558.3	548.9	552.6	557.1	559.1	548.8
Sweden		558.5	530.4	520.9	539.9	539.3	549.0	549.0	549.7	545.1
England and Wales	753.2	783.3	745.0	696.1	710.5	695.0	681.6	659.2	673.5	637.8
Northern Ireland	665.7	714.1	739.1	664.7	707.8	732.8	749.7	670.7	709.2	718.0
Scotland	838.6	843.2	845.9	770.2	796.6	788.9	789.1	768.5	800.5	757.3
Israel								548.9	525.1	554.3
Italy	849.6	905.4	841.2	828.5	836.3	836.1	770.5	798.6	780.5	
Yugoslavia	926.5	1031.2	994.4	972.4	1028.9	906.6	858.2	828.9	799.6	816.9
Austria		957.4	957.2	898.2	904.7	858.4	853.8	856.6	822.6	811.5
Belgium	919.0	926.6	901.0	881.8	881.7	884.8	847.1	856.0	859.4	
Germany, Federal Republic of	912.7	933.9	908.3	862.6	862.9	856.6	839.1	860.5	822.5	797.3
France	1050.3	1084.6	995.3	994.9	1007.4	975.3	977.9	966.1	969.4	943.0
Netherlands		694.7	685.5	682.9	680.7	668.6	659.4	678.3	670.5	640.8
Switzerland		816.9	782.8	770.5	746.5	729.6	730.7	679.3	669.3	654.3
Japan	755.0	756.1	758.6	709.8	689.1	678.4	668.2	644.6	626.8	606.6
Canada		660.6	662.6	656.0	664.6	675.5	671.8	668.3	661.7	646.0
United States	805.6	794.6	794.7	769.7	778.8	770.7	751.0	734.8	726.3	713.0
Australia	691.2	687.7	718.4	669.8	675.7	677.0	711.2	648.0	652.1	629.2
New Zealand	614.0	629.5	677.3	634.0	624.2	672.8	633.9	652.3	649.2	663.7

Source: See table 13.

Figure XI. Standardized death rates for ages 40-69 years for cardiovascular diseases in some groups of European countries and Japan, 1969-1977, females



Source: See table 13.

Table 14. Standardized death rates at ages 40-69 years for ischeamic heart disease and other cardio-vascular diseases in 27 countries, 1968-1977, females

(Rates per 100,000 population)

Country	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Bulgaria	347.8	371.1	368.9	378.0	375.2	367.5	374.5	362.2	373.7	385.0
Czechoslovakia	328.9	350.9	349.8	351.5	332.2	336.5	342.5	326.1		
Hungary		387.6	374.6	379.6	375.0	372.3	369.0	360.3	367.2	364.4
Poland		290.7	282.1	290.1	268.0	276.1	275.3	273.4	281.6	284.7
Romania		426.8	410.5	410.5	397.4	415.2	382.6	374.9	386.3	393.9
Denmark		221.5	220.2	208.8	214.6	205.2	208.6	201.6	209.0	181.5
Findland		399.0	370.1	373.7	334.8	310.2	305.9	293.2	293.7	265.4
Ireland	386.8	399.0	364.0	353.4	357.4	356.9	363.8	371.6	317.9	329.3
Norway		219.9	206.0	198.7	199.4	184.0	191.5	179.0	175.0	171.4
Sweden		205.7	197.0	201.5	190.0	184.7	174.2	181.3	172.4	162.4
England and Wales	306.3	307.7	298.5	288.9	296.0	290.8	288.8	277.4	276.5	266.6
Northern Ireland	405.1	407.1	400.3	364.6	404.1	384.9	368.5	369.1	390.6	361.5
Scotland	418.8	421.7	410.8	409.2	412.0	410.7	406.9	379.0	391.5	364.8
Israel								361.5	322.9	323.9
Italy	288.5	288.3	255.6	246.6	240.5	242.1	226.9	223.6	220.1	
Yugoslavia	321.7	345.3	303.0	289.7	311.3	306.4	324.1	334.1	332.6	315.6
Austria		292.8	276.7	266.8	256.0	248.1	240.6	244.7	239.6	233.5
Belgium	279.8	273.4	272.9	263.4	247.0	244.9	235.5	228.3	222.3	
Germany, Federal Republic of	260.4	266.7	257.9	247.3	239.4	228.7	223.8	221.7	213.4	198.6
France	177.0	179.4	169.5	168.3	161.8	152.4	149.5	146.7	139.0	128.6
Netherlands		204.8	205.2	193.4	195.7	192.6	184.5	176.3	171.2	169.4
Switzerland		207.0	185.3	182.2	174.3	165.1	155.4	161.3	156.0	145.9
Japan	301.7	292.1	288.0	265.0	245.1	238.8	230.3	209.7	201.0	189.4
Canada		271.1	266.0	245.3	245.1	242.5	240.5	238.5	227.0	214.5
United States	376.3	357.2	351.2	334.2	330.2	319.1	301.0	284.0	274.7	265.7
Australia	400.1	379.9	387.0	363.7	351.2	332.3	351.6	318.2	296.4	281.2
New Zealand	372.4	353.7	341.8	333.9	343.7	337.0	330.2	308.3	302.7	323.1

Source: See table 13.

In Eastern Europe (including Yugoslavia) mortality has been rising since 1969, with the rise accelerating at the end of the period, after 1975. We have seen earlier that the deterioration of health in Eastern Europe was significant chiefly at the end of the 1970s. Since the statistics published by WHO stop in 1977, they are affected by only the beginning of this deterioration and it seems reasonable to believe that the rise in mortality will continue to accelerate after 1977. In the other European countries, on the other hand, there is a falling trend, the decline being slower for the vanguard and rearguard of these countries. In Japan the decline is really spectacular. Accordingly, a preliminary conclusion is unavoidable: among men mortality from cardio-vascular diseases plays an important role in the deterioration of health in Eastern Europe.

In the post-war years, until about 1965, male mortality from cardio-vascular disease was rising in many countries, including those in Eastern Europe. In the latter countries mortality has continued to rise, whereas it has tended to decline in other European countries. That is the real change that has occurred recently in male mortality in the capitalist European countries and Japan. After a long period of upward movement, the frequency of deaths from cardio-vascular diseases decreased. Table 13 shows, in particular, the progress made in the United States, which has been the subject of a great deal of press comment. It is less certain whether Australia and New Zealand have had the same success. Finally, it must be pointed out that it is these three countries which, even after recent advances, have the highest mortality from cardio-vascular diseases (exceeded only by Finland).

Female cardio-vascular mortality

Table 14 and figure XI describe the trend in female cardio-vascular mortality since 1969. In Eastern Europe (including Yugoslavia) female cardio-vascular mortality was almost invariable from 1969 to 1977. After the Second World War female cardio-vascular mortality was declining and the fact that it became stable in Eastern Europe (including Yugoslavia) must be considered as a deterioration in health. In the remainder of Europe and in Japan the decline is continuing. Therefore, cardio-vascular mortality seems to play an important role in the deterioration of female health - as in that of males - in Eastern Europe (including Yugoslavia).

Mortality associated with diseases other than cardio-vascular diseases

We must now turn to mortality attributable to diseases other than cardio-vascular diseases. The data are given in table 15 for males and table 16 for females. These two tables are illustrated by figures XII and XIII.

For this set of causes of death there are no obvious differences between Eastern Europe and other countries. The only feature to which attention need be drawn is a rise in male mortality in Eastern Europe (including Yugoslavia) at the end of the period, when the decline continues in other countries. This

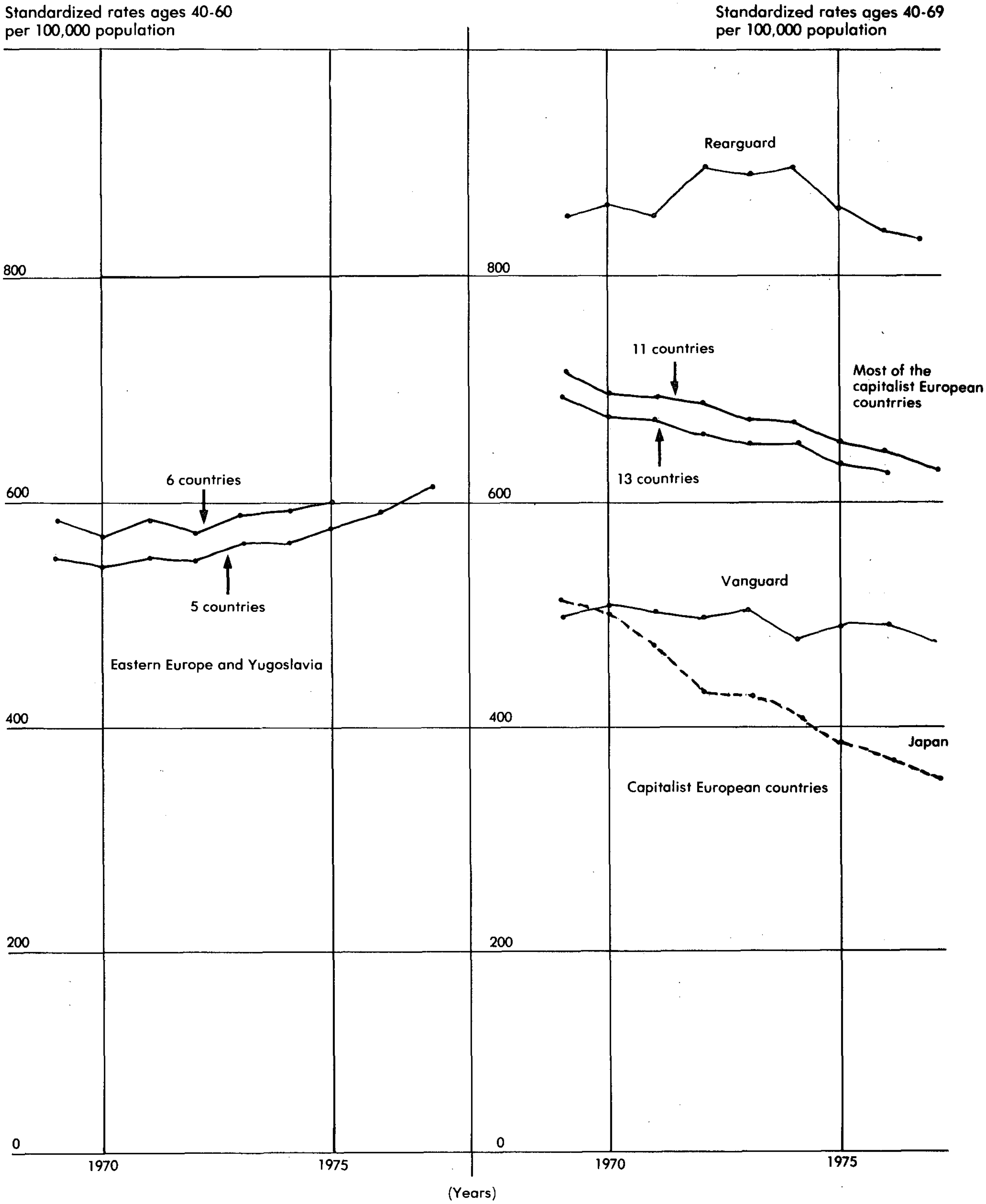
Table 13. Standardized death rates for ages 40-69 for ischaemic heart disease and other cardio-vascular diseases in 27 countries, 1968 to 1977, males

(Rates per 100,000 population)

Country	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Bulgaria	435.8	472.7	477.3	499.9	515.6	513.1	538.5	545.6	557.9	614.6
Czechoslovakia	659.2	720.5	727.7	715.0	707.9	715.8	719.3	706.8		
Hungary		660.7	677.3	685.1	657.0	665.6	664.7	670.0	688.4	709.3
Poland		557.9	558.8	592.0	560.4	588.5	580.0	606.1	636.3	660.5
Romania		576.7	551.4	562.5	549.0	579.0	547.2	546.6	563.2	583.5
Denmark		528.0	518.8	522.9	534.7	532.8	530.6	529.6	558.7	519.1
Finland		1040.5	985.6	1036.3	957.0	962.7	948.8	912.7	938.4	923.9
Ireland	688.5	706.8	707.8	681.4	712.8	721.3	730.1	707.5	679.4	701.9
Norway		579.2	578.7	555.3	550.6	550.6	533.5	535.0	521.5	515.1
Sweden		480.4	475.1	498.9	485.6	497.3	487.6	490.7	500.2	485.8
England and Wales	714.1	726.0	714.2	709.9	728.7	712.8	708.0	695.6	687.0	675.9
Northern Ireland	794.1	843.1	860.6	833.2	876.7	857.4	898.7	848.1	835.1	881.9
Scotland	860.1	867.0	856.2	869.1	897.8	903.0	877.6	857.4	838.0	806.8
Israel								540.8	553.8	523.1
Italy	524.9	527.5	475.5	471.7	463.2	470.2	461.5	475.8	470.3	
Yugoslavia	439.6	501.7	449.9	445.5	472.4	476.1	492.6	515.4	508.7	504.6
Austria		624.1	619.6	599.6	586.5	562.6	579.5	570.1	579.7	561.3
Belgium	644.1	635.5	615.0	626.5	607.9	581.5	564.1	552.7	554.9	
Germany, Federal Republic of	593.1	604.2	575.1	580.8	579.5	561.7	549.4	555.5	546.0	520.1
France	418.0	421.1	389.4	398.3	392.8	377.7	384.0	379.7	366.1	339.7
Netherlands		504.2	541.8	514.6	538.2	500.3	494.3	505.6	502.0	479.0
Switzerland		431.5	423.8	427.8	408.3	396.6	387.8	420.2	416.7	411.0
Japan	517.5	503.6	499.5	465.1	428.7	421.0	403.9	378.9	364.1	348.7
Canada		681.1	686.4	652.8	654.5	640.8	637.9	619.4	610.6	602.4
United States	874.6	848.4	832.1	807.1	805.5	782.5	743.0	703.1	684.0	656.4
Australia	887.4	860.1	862.5	823.3	805.4	797.3	786.4	726.0	711.3	672.7
New Zealand	825.0	794.9	789.9	801.7	734.7	766.0	737.8	723.7	678.5	702.5

Source: World Health Organization, World Health Statistics Quarterly, vol. 35, No. 1, (Geneva, 1982).

Figure X. Standardized death rates for ages 40-69 for cardiovascular diseases in some groups of European countries and Japan 1969-1977, males



Source: See table 13.

Northern Europe

Denmark
Finland
Ireland
Norway
Sweden
England and Wales
Northern Ireland
Scotland
(Iceland missing)

Southern Europe

Israel
Italy
Yugoslavia
(Albania, Cyprus, Greece, Malta, Portugal and Spain missing)

Western Europe

Austria
Belgium
France
Germany, Federal Republic of
Netherlands
Switzerland
(Luxembourg missing)

Overseas Europe

Canada
United States
Australia
New Zealand

Japan

The USSR is, unfortunately, missing, and this is a country for which causes of death are unknown, save for total deaths).

Male cardio-vascular mortality

We shall in fact be dealing with two major causes: deaths from cardio-vascular diseases, and all other deaths, that is, deaths from diseases other than cardio-vascular diseases. We shall begin with cardio-vascular diseases and take male mortality first. Figure X and table 13 show the trend of the standardized male rates for ages 40 to 69 for 27 countries. The graph is confined to the groups of countries identified in the earlier analysis. These groups are: Eastern Europe, together with Yugoslavia, whose cardio-vascular mortality is following a rising trend comparable to that observed in the East; [12] the group of capitalist European countries; [13] the vanguard of capitalist European countries; the rearguard of capitalist European countries; and Japan.

We shall now turn to a different field which may cast some light on this 20-year mortality trend in the industrialized countries: the field of causes of death.

CAUSES OF DEATH

Statistics on causes of death are published, of course, by countries themselves but are also collected in the yearbooks of the World Health Organization (WHO), which issues them in a standard format and supplements them by computing death rates by age group separately for males and females. Deaths are broken down by cause according to a classification devised by WHO which is revised periodically. These revisions are essential in order to allow for developments in medicine, but they make inter-year comparisons very difficult. In principle, valid comparisons can be made only within the period between one revision and the next. The most recent revision of the International Classification of Diseases goes back to 1975, but in practice it has been used from 1977 onwards. The previous revision was in 1965 and most countries applied it from 1968 onwards. Our investigations will therefore deal with the period 1968-1977.

When one begins to study causes of death, the wealth of data is overwhelming. WHO publishes for each country sex-specific death rates for 150 causes (list A) and for 10 age groups. For any given year, that gives 3,000 coefficients. Obviously some grouping must be made in order to find one's way through this forest of figures; one may start by identifying five major groups: (a) infectious and parasitic diseases, which are, in any event, on the way out; (b) cancer; (c) cardio-vascular diseases; (d) other causes, excluding violence; and (e) deaths by violence.

Mortality from cardio-vascular diseases

For group (c): deaths from ischaemic heart diseases and other cardio-vascular diseases (which will hereinafter be described simply as "cardio-vascular mortality"), WHO has published in a recent pamphlet sex-specific death rates by five-year age groups between ages 40 and 60 years (seven age groups) for each year from 1963 to 1977. Moreover, a standardized rate for ages 40 to 69 years is calculated for each year on the basis of a standard population. 11/ Twenty-seven countries are represented and they are divided among the groups mentioned in the previous sections as follows (names of missing countries are given):

Eastern Europe
Bulgaria
Czechoslovakia
Hungary
Poland
Romania
(German Democratic Republic missing)

case-by-case basis, include: access to health care, e.g., health education, birth spacing, care during pregnancy (some pre-natal examination(s), treatment of anaemia and malaria), care during delivery; access to food and to nutrition education; family and community practices, e.g., reduction of workload during last three months of pregnancy.

Faltering growth. In addition to breastmilk, infants from 4 to 6 months onwards need supplementary weaning foods specially prepared from family and local foods until they can eat from the family pot (at 24 to 36 months). In addition to insufficient or ill-prepared food, frequent attacks of diarrhoea and other illnesses contribute to faltering growth. Awareness of the relation between growth, nutrition and health can be promoted by use of a growth chart if there is the necessary supporting organization. The main measures for dealing with faltering growth are discussed below.

Diarrhoeal disease control

This becomes a problem at the age when breastmilk ceases to be the sole source of food and liquid. Oral rehydration therapy, including the use of home-made solutions, reduces mortality from diarrhoea, especially if given early. Frequency may be reduced by education about personal, household and community hygiene, availability of soap, etc.

Breast-feeding and good weaning practices

The protection and support of breast-feeding is of crucial benefit during infancy and beyond, if it is maintained past the age of 12 months. It is the main intervention that will help infants between the ages of 1 month and 4 to 6 months. (During the first month they benefit from care during pregnancy and delivery.) In addition, breast-feeding helps with child spacing. Good weaning practices are a major factor in avoiding faltering growth. The amount of extra local food required is small. Lack of income is not, therefore, the only constraint. There may also be important social and organizational constraints, e.g., lack of knowledge about how to prepare appropriate local foods, mothers' time required; lack of community production facilities, e.g., grinders; absence of mother working long hours; too long periods between meals; difficulties of storing prepared food; shortage of fuel, etc. These problems need to be addressed by various local arrangements strengthened by appropriate health education. Anaemia and vitamin A deficiency may need to be addressed through the weaning diet.

Expanded Programme of Immunization (EPI)

Tetanus toxoid for pregnant women protects the newborn from tetanus. Whooping cough (pertussis) immunization protects during infancy and beyond. The other five vaccinations of the EPI package should also be given during infancy, but protect more against early childhood diseases. Some would class protection from malaria, especially in tropical Africa, as a need equally serious as that for immunization.

Child-spacing services

The infant or child born less than two years after a sibling is normally about twice as likely to die as one born four or more years after, even after taking account of educational level and income. Child-spacing services are an important component of primary health care and may be delivered through a variety of channels.

Essential drugs

These are drugs needed to deal with major causes of child mortality such as malaria, acute respiratory infections, anaemia in pregnant women (a main contributing cause of maternal and neo-natal mortality), vitamin A deficiency and, in some areas, eye infections. All areas need oral rehydration salts, an anti-infective/antibiotic, an antipyretic/analgesic, e.g., aspirin, and contraceptives.

Health education promotion

This is essential for individual, family and community self-reliance and political commitment (which must be shared by the people as well as top government leaders). Provision for better access to information is a second, related essential aspect. The potential of the communications media is generally under-used, as is that of non-governmental organizations.

Three additional basic needs may be more costly to service, although some low-cost measures are available to mitigate them.

Food entitlement

How to deal with families, particularly those headed by women, if they cannot afford enough to eat is one of the most difficult problems for basic needs satisfaction. Family food production, home food conservation, community production, woodlots for fuel and the availability of opportunities for women to earn income may alleviate the problem. In some social settings, the community may assume some responsibility for these families. National supplementary feeding programmes may also be required.

Water supply and sanitation

These are basic preventive interventions which also contribute directly to convenience and reduction of women's workload. While the capital cost of installing a water supply may be higher per family than the other interventions listed here, it is often within reach of external donors and the Government. Very large gains in health might also be achieved by appropriate water storage and by the knowledge of water-use habits. Similarly, latrines can be relatively cheap to install, but much more community education regarding latrine use is required. Knowledge of factors inhibiting use of latrines can form a basis for health education interventions.

Education of women

Education of women is highly correlated with better child survival and development. Women's literacy movements and participation in women's organizations can help the generation that missed school.

Access to services, community responsibility and delivery of technical support

Structure of delivery system

Most "low-cost" interventions are only low cost if there is a means of access and a delivery system for technical support services. The least recommended course for countries in difficult situations is a series of separate vertical delivery systems. In fact, most of the above interventions cannot be effectively implemented without at least an incipient primary health care structure, including active community involvement in particular. Without community support, even immunization - the intervention that places the fewest demands on beneficiaries - is usually limited in coverage and cannot be sustained.

The primary health care recommendations to which WHO and UNICEF are committed involve a systematic approach to this problem, comprising three main elements: (a) Family members should take as much responsibility as possible for their own health. Good personal and family hygiene and the use of home-made mixtures for oral rehydration are examples. In general, health education is a major intervention for the application of this principle. (b) The community should have non-technical responsibility for health care at the primary level, with some budgetary and other support from government services. (c) The intermediate level of government (district or province) should provide technical, logistical, financial and referral support to these services in as integrated a manner as possible.

It may take up to 10 years or longer to get such systems working well. The introduction of a "minimum package of services" is recognized as one of the means of building primary health care and is likely to be particularly applicable during financially difficult times.

Community responsibility

This is one of the most difficult components of the system to put into effect and it is the weakest primary health care element at present. Community contributions of "human investment" in constructing clinics, digging wells or assembling children for immunization are not enough. Rather, communities should actively initiate, implement and evaluate the changes they seek to bring about. They should take some financial and management responsibility, in particular, for community-level workers (without, of course, the poorest community areas being left completely by the Government to look after themselves financially). Community responsibility will need some community structure - existing or new, e.g., community development councils.

The community approach may be the best hope for extending services at present. In many countries, central budgets will not for some time be in a position to meet the full costs of extending health and children's services.

Accepting and encouraging community responsibility requires changes in administrative attitudes and practice. Under the terms "social development management" or "people-centred development", experience is being gained by non-governmental organizations in particular. The thrust of these efforts is directed towards maintaining frequent and direct contact between administration and community residents so that, through ongoing dialogue and joint learning experiences, both groups can bring about improved services.

Community health worker (CHW)

Of the measures listed above, those relating to growth, diarrhoea, breast-feeding and weaning, home food production and conservation, clean water handling (including personal and domestic hygiene) and child spacing depend very much on personal and family action. The presence of a CHW and a locally active women's organization are key supports for developing such action. The CHW's ability to help families deal with common illnesses and accidents responds to needs more strongly felt than those for preventive activities. A CHW living in her own community can bring about a quantum jump in access to services, e.g., by home visiting. In addition to the health service facility to which she may refer cases, her work can be supported by messages through the communications media.

At present, the CHW is more often an employee of the health services but, according to primary health care recommendations, she should be responsible to the community, with technical guidance from the health services. Male CHWs have been found less effective in working with pregnant and nursing women and in child care; therefore, if there is to be only one CHW, a woman is better.

If communities lack the income or organizational capacity to assume responsibility for a CHW, the first step may be more co-operation between the health services and workers already in the community, such as traditional birth attendants and traditional healers. In continents where such attendants and healers are, in fact, responsible for a greater part of health care in low-income populations, practical steps to support and improve their work can make a big difference. There is extensive experience of the co-operation of health systems with traditional birth attendants, but less with traditional healers in some of the developing regions.

Another interim step is for paraprofessional workers in a health centre or in a vertical programme to go periodically to communities to prepare immunization sessions, to do health education, etc. and, in better-off countries, even to do home visiting, e.g. the "promotora" in Latin America. However, in low-income countries such workers typically have too large a population to serve effectively. The objective should be to use them as a liaison channel with the more numerous CHWs.

Cost aspects and economic feasibility

As indicated throughout this paper, the child survival package is a rather new concept. While information exists on the cost range of some of the components of the package, 9/, hard data on the cost of a complete minimum package of services to be provided to communities are much more difficult to determine. Before we turn to the available information, a number of remarks are in order.

First, with the exception of food, the cost of the end-supplies to be delivered (oral rehydration salts, growth charts, vaccines, essential drugs, etc.) does not vary much from country to country and can therefore be calculated with a relatively high degree of precision. The cost of these supplies is normally quite low, i.e., five to seven United States dollars per child covered per year.

Secondly, the cost of supplementary feeding varies substantially with the extent of the supplementation. Are only some micronutrients or part of the regular food requirement supplied? How frequently? Cost varies with the coverage (does it extend to only the relatively few severely malnourished children or include the many more who are moderately and mildly malnourished?), as well as with the age bracket targetted (only children of age 0-5 or all children in the 0-14 age bracket?). For all those reasons it is difficult to give a precise idea of the cost of food supplementation. It can still safely be maintained that supplementary feeding is a relatively expensive type of intervention.

Thirdly, a large proportion of the overall cost can be absorbed by the delivery cost. This, however, varies quite a bit depending on how the delivery system is structured. In some cases, it may be possible to graft it on to existing programmes at a modest marginal cost. In cases of well-organized and participatory communities, the delivery can take place largely on a self-help basis, i.e., at a low cost. When these opportunities are not at hand, however, it will be necessary to create a delivery apparatus almost exnovo and at high cost. Unfortunately, this seems to be the case in the poorest countries.

It follows from the above discussion that the figures arrived at in each cost assessment exercise are country specific and must be adjusted, if used to determine the cost of the same package in another country, by the differential price level between the two countries.

In view of the limited experience gained thus far with the overall package (which includes all or most of the components described in the section on available measures, above) only one specific UNICEF assessment of its overall cost exists. This applies to Indonesia, where a child survival package including growth monitoring, oral rehydration, breast-feeding, immunization, family planning and food supplementation has been extended over the last few years to several million children. The assessment indicates that the cost per child per year oscillates between 11 and 13 United States dollars if supplementary feeding is excluded and between 26 and 30 United States dollars if it is included. Supplementary feeding in the case of Indonesia covers only about 5 per cent of the total child population aged 0 to 5. The relatively high cost incurred can be partially attributed to a still unsatisfactory use rate of the existing services owing to the need for further programme consolidation.

An attempt at reconstructing the cost of an ideal child survival package as described above indicates that the annual cost per child per population covered can be estimated between 25 and 30 United States dollars. Such an ideal package, which would include daily supplementary feeding to 30 per cent of all children suffering first-, second- and third-degree malnutrition, would assume best practice conditions concerning the use rate of the services and a streamlined delivery system. 10/

An assessment of the economic feasibility of extending the package to all Indonesian children indicates that such a programme would absorb an expenditure slightly below 1 per cent of the current gross domestic product. It is felt that the necessary resources, although quite large in absolute terms, could be mobilized from a variety of sources. In addition to the deployment of government support services from the centre towards the periphery, there are often paraprofessionals at the periphery who could be better employed. Redeployment of personnel that is insufficiently used is very important in the long run. Additional resources could be mobilized from the government budget and the community involved and from a sustained effort by foreign donors, who may have to agree to bear, particularly in these years of continued recession, some of the local recurrent costs.

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ANNEX

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C. Financial analysis: a critical determinant for the viability of health programmes

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INTRODUCTION

Health planners direct considerable effort toward the collection of health statistics for programme planning and evaluation. Substantially less effort is focused on financial analysis and its use as a tool for planning and evaluation. It is our thesis that sound financial analysis is of critical importance to the design, implementation and evaluation of any health programme. This presentation will direct attention to some important applications learned from several health projects undertaken in developing countries. We do not intend to provide a detailed description of the projects or to suggest solutions for all types of financial problems, but rather to illustrate with practical experiences the need to make financial analysis an essential discipline in health programme development. Although the examples given are drawn from experience in developing countries, the need for financial analysis and the type of analysis presented are equally applicable and valid in developed countries.

The severe financial constraints in developing countries make the problems and potentials stand out in bold relief when compared to those in industrialized nations. Despite a growing consensus that Governments in developing countries should do more within the health sector, financial constraints limit their capacity to act more forcefully. The amelioration of these constraints, along with measures to make more effective use of limited resources, is among the major challenges facing government authorities and donor organizations seeking to improve health status.

Reviewing past programmes, one can conclude that the efforts to expand basic health coverage and to develop a comprehensive care system have often led to over-ambitious programmes to create additional infrastructure and to train and deploy manpower that are based on models in industrialized countries and undertaken with insufficient regard for the recurrent budget required for the proper operation and utilization of the system. Over time, these budgetary requirements have tended to grow very rapidly against a background

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of grim and often deteriorating financial prospects confronting many developing countries - unfortunately, often those with the greatest health needs. Faced with the need for cost containment or financial adjustment, some countries have resorted to cutting operational budgets while sparing or curtailing less sharply capital investments and training activities because they usually have tangible outputs and unmistakable political appeal and are perceived as being more attractive to external donors. As investment activities, however, they lead to increased future demands on operational budgets that are typically already overstrained. Furthermore, within the operational budget certain patterns can also be discerned: personnel expenditures are rarely trimmed, while other operating expenditures, including maintenance drugs and supplies, bear the brunt of cutbacks. The structure of health expenditures, when carried out over a sufficient time, becomes increasingly unbalanced and the effectiveness of past investments is severely penalized. Health facilities deteriorate for lack of maintenance. Personnel are constrained in the performance of the tasks for which they were trained because of a shortage of drugs, supplies, equipment in working condition, transportation, supervision and in-service education. These cutbacks tend to affect primary level health services proportionately more severely than tertiary level services.

At the national policy level, there is a recognition of these trends and an increasing awareness that government resources along will not be sufficient to achieve the Alma Ata objective of "Health for All by the Year 2000". As a consequence, increased attention is being paid to financial management of health programmes and cost-recovery mechanisms. Current themes include: cost-effectiveness analysis, cost-recovery mechanisms for public sector health services, promotion of the role of the private sector, attention to traditional practitioners, and education for self-care in health problems. These themes focus on the need to reduce costs, usually to the public treasury, of operating a health system. The desired savings, however, are the aggregate effect of individual decisions of health care providers and consumers. This implies that a national approach to achieving system-wide cost reductions in a real world of constrained resources needs to include as a necessary adjunct a technical analysis of service impact and consideration of the impact of financial transactions, whether in cash or in kind, on provider and consumer behaviour. This is particularly true when analysing the feasibility of replicating successful pilot or demonstration programmes.

To illustrate the crucial role of financial considerations in the outcome of health programmes, we shall cite selected examples from projects in developing countries, including some of our own project experiences. From these experiences we shall draw some recommendations regarding collection of necessary financial data to determine financial viability, to measure the impact of service pricing decisions on care patterns, and to assess cost effectiveness and programme replicability.

COLLECTION OF FINANCIAL DATA AND DATA ANALYSIS

The Pikine project is a primary health care programme that was developed as part of the Belgo-Senegalese Technical Co-operation Programme in Senegal, a developing country in West Africa.1/ The project is located in an area of rapid and spontaneous population growth near Dakar, the capital. At project inception in 1975 the total population in the project area had grown to about 250,000 and included a sizeable proportion of rural immigrants. The rapid population growth, combined with the Government's inability to increase funding to the Ministry of Health facilities in amounts commensurate with the growth in health needs, led to a situation in which a decreasing proportion of the health needs of Pikine's population was being met through the public sector network. Coverage of recent immigrants settling in previously undeveloped areas was particularly low. The principal contributing factors were a chronic shortage of drugs at the government health facilities and an unfortunate but widespread practice on the part of government health workers to make unsanctioned demands for payment for services and drugs that were nominally provided free of charge. As a result, most of the population sought care elsewhere, either at private dispensaries and pharmacies in the project area, where services and medication were available but expensive, or at the nearest hospital outpatient facility in Dakar, at a distance of about 15 kilometres, where further unsanctioned charges were likely to be made.

The situation prevailing in the Pikine area was a source of grave concern to the Government of Senegal and prompted it to single out the area as one in which to implement a new approach to primary health care. Furthermore, a package of administrative reforms was enacted at about the same time as the project concept was developed. These reforms aimed at decentralizing public administration and encouraging community participation in economic, social and cultural development. They provided a juridical basis for instituting locally managed cost recovery mechanisms as a means of overcoming the chronic shortage of funds faced by the Ministry of Health. A paradigm of community participation expressed through elected leaders and with the assistance of health professionals was used to develop a project scheme through which the community was able to address and meet some of its most pressing health needs. In financial terms, the project leaders sought to determine whether the funds then being spent by Pikine inhabitants for basic health services and drugs could not be more effectively utilized if they were rechannelled into a community-managed health care scheme. Given popular interest in such an undertaking, the project health professionals and community leaders sought to determine progressively: (i) the best mix of health services that might be provided by combining activities that could be effectively funded through the Ministry of Health with other activities that could be supported directly by the community; (ii) cost-recovery mechanisms that could generate a high level of resource mobilization while ensuring equitable access to basic health services; and (iii) financial and technical management control systems that could be administered by a popularly elected health committee and health professionals. An important secondary benefit of the project was to reduce the outpatient load at the Dakar Hospital.

To pursue these objectives, existing information was compiled and additional data collected in four areas of interest: epidemiology, health finance, socio-economic status and management systems. The table annexed to this paper summarizes the data sought and the source of information. The right-hand column of the table also indicates the financial data that would be needed to determine project replicability on a national scale. The data listed in the table are not intended as either an all-inclusive list or a minimum data set. The purpose of the table is to illustrate the type of data used at various times in planning and monitoring the Pikine project.

Two principal sources of epidemiological data were available to guide project designs: a doctoral thesis on the morbidity patterns in the project area 2/ and a study on the health environment and health infrastructure in the project area carried out jointly by the Universities of Dakar and Leiden. 3/ These documents provided an epidemiological assessment of health and medical needs of the population on which the services/activities to be provided under the project were based and their health impact estimated. To complete this information, a list of essential drugs and their unit prices was drawn up because of their important economic and health impacts on drug dispensation. Price information was subsequently used to define, and later to review, least-cost, standardized treatment schedules for major complaints referred to health services. These schedules were reviewed on a regular basis and updated to reflect in the relative prices of drugs.

In the financial area, data were collected on funding patterns relating to the Government's health system in the project area and on the financial payment capacity of the local population. Data relating to funding patterns were principally drawn from an informal analysis of the funding patterns of the Government's health services in the project area. It revealed that funds to pay the salaries of nursing and medical personnel were provided in a timely manner while funds to purchase drugs and to meet other operating expenditures were substantially below budget and often provided only after long delays. It also indicated that the health centre, a secondary-level facility with a referral capacity and a maternity section, was comparatively better funded than the primary-level health posts. Analysis of the application of funds tended to corroborate a finding of the previously cited study on health environment and health infrastructure regarding a relatively poor performance by the government in supervising peripheral health posts and in providing in-service training. The above findings were taken into consideration in deciding how to allocate the primary responsibility for funding the various aspects of the project among the Government of Senegal, the community and the Belgo-Senegalese Technical Co-operation Programme. It was decided to channel the Government's input to the salaries of medical and nursing personnel at the health posts. The Belgo-Senegalese Technical Co-operation Programme was given responsibility for financing project supervision, training programmes and the expansion of the health post network. The local population was made responsible for funding of the remainder of the project's operational expenditures, including drugs, auxiliary health personnel and other operating and regular maintenance expenditures.

Data relating to the population's ability to pay were developed through a three-stage process that involved extensive discussions between the Project Steering Committee and the District Health Committee and led to the preparation of pro-forma budgets for community-supported activities. Most of these data were generated by interviewing a random sample of households. 4/ First, a maximum fee that could be charged for an emergency consultation was estimated by determining the discretionary income a woman could have at her disposal within her household budget or could count on borrowing from a neighbour shortly before payday. The data collected suggested that a fee of about 100 CFA francs (about $ US 0.35) could be afforded by more than 90 per cent of the project area households. Secondly, this fee was compared to the costs of treating a typical disease episode. Since it was insufficient to cover the treatment costs, a decision was taken to require payment to a health facility of a fee for each visit (rather than for each disease episode). Furthermore, based on an analysis of the relative medication costs of treating children and adults, the consultation fee for pre-pubescent children was reduced to 50 CFA francs (about $ US 0.18). Thirdly, an upper bound to the project's operating costs was estimated by: (i) projecting the level of resources that would be generated through consultation fees if utilization rates at the Ministry of Health facilities rose to the levels observed in the private dispensaries and (ii) adding to this figure the financial contributions of the Government and the external funding agency. Principles relating to the application of these funds to personnel, drugs and other operating expenditures were also agreed upon and served as a basis for constructing the first pro forma budgets for the project. Once the project got under way and showed signs of popular acceptance, arrangements were introduced to waive consultation fees for the members of the community recognized by the community as being destitute (less than 5 per cent of all consultations) and to set special fees for the treatment of chronic illnesses such as tuberculosis and leprosy.

Socio-economic data were collected to determine perceived priorities of health needs and to estimate effective demand for health services. Community leaders and representatives were asked to list the major health problems they wished could be addressed at the health post and at the health centre levels and to describe the characteristics that made a health service desirable. The outcome of these inquiries confirmed: (i) a large unmet demand for health services at close proximity to the home, particularly for simple curative acts*; (ii) a willingness to pay a reasonable fee to gain access to basic health services; and (iii) a preference for a simple fee structure giving a patient a right to a consultation and, in the case of health problems that could be handled at the health facility, to the required medication without additional charge. To verify these findings, a study of the place of residence of the neighbourhood health facilities was undertaken. This study revealed that 70 per cent of all consultations were made by people living within 500 metres of the facility. 5/ The effective demand for health services was also estimated from the records of the private dispensaries in the project area chosen because of high attendance records (on average over 200 consultations daily). This information was complemented by a sample survey of the community to determine the reasons why the local government health facilities were not used and particularly why they were not used for regular treatment of tuberculosis. This survey was carried out by medical students and volunteers from the community. 6/ Finally, a study of household incomes and expenditures to estimate savings and investment capacity was not considered necessary, as it was not intended that the project's investment programme be supported by the community, and sufficient data on the community's ability and willingness to pay for the recurrent costs of health services had already been gathered.

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*Considerable demand for maternal and child health care services was registered, particularly for institutional deliveries that could be supervised by midwives. Because of the project's limited scope and the shortage of trained manpower for a number of key maternal services and in light of the much higher costs of providing supervised child delivery programmes, services to meet these needs were introduced into the project only in 1979. They have been well accepted and demonstrate the feasibility of incorporating preventive health services in a community-funded health programme.

Managerial aspects of the project afforded a major and unexpected challenge. The community had not previously been responsible for administering development programmes and the cost-recovery scheme for operating expenses gave rise to a series of issues. The main issues centred on how to balance technical, financial, social and professional considerations in budgeting and controlling expenditures. Relatively mundane aspects of financial management in capital-rich countries assumed major importance. These included: how to estimate working capital needs and to provide for increases in working capital as the volume of activities rose, how to limit fraudulent use of funds and how to prevent the scheme from becoming a welfare or an employment-creation agency. These aspects are cited merely to illustrate that seemingly minor financial considerations have the potential to impede project function; a more extensive discussion is beyond the scope of this report.

Many health projects have the potential for replication or expansion if successful. However, cost-effective replication requires collection and careful analysis and extrapolation of data from the pilot project. These data requirements are listed in the right-hand column of the table annexed to this paper. An analysis of replicability needs to focus on two sets of issues.

First, the relationship of unit costs to changes in programme size must be studied. Assuming that a project is replicated in areas largely similar to those that prevailed in the pilot area, some returns to scale can be expected. Unit costs are likely to increase, however, if the project is expanded into areas where conditions differ significantly or where access to services is more limited. Moreover, it may generally be assumed that the design of small-scale projects is optimized with respect to the particular environment in which it was developed but may require adaptation if it is to meet needs at the least cost in other environments. Finally there is the "invisible" motivational impact of pilot project management that becomes diluted as scope increases with resultant losses in cost-effectiveness.

Secondly, there are the issues of the transferability of assumptions about financial behaviour from the initial project area to the enlarged area in which replication is desired. These include: levels of income, patterns of resource allocation for health services, scale effects on costs as utilization rates change significantly and differential costs. To take the Pikine example, project success and the form of the project were related to several features of the project area: the setting of an urban population having a relatively high proportion of income in a monetary form; a high population density that could be translated into high facility utilization rates (and lower unit costs); proximity to drug supplies and to higher level health facilities that facilitated referrals and personnel supervision; higher levels of education and greater familiarity with the financial concepts required for operating a community-funded programme. These foster project success in an urban setting but might hinder it in rural areas. In financial terms, the 100-franc cash-payment-per-adult consultation could be afforded in Pikine but it might be excessive in many rural areas. Against the likelihood of a smaller payment capacity in rural areas, one is confronted with the fact that providing similar health services under similar principles of cost-recovery to a dispersed and smaller rural community is likely to require substantially higher fees as a result of higher access costs, lower utilization rates and a greater demand for basic curative services (arising out of a greater ignorance of modern hygiene and health concepts and lesser access to public health programmes. The risks of error associated with unknown and unmeasured factors in this field merit considerable study, both in technical and in financial terms.

OTHER USES OF FINANCIAL ANALYSIS IN PROJECT DESIGN

Financial data have other uses in developing and evaluating the design of health projects. Three aspects can be illustrated from the experience of others: assessment of financial viability, effects of service pricing on utilization patterns, and cost-effectiveness or relative efficiency of altenative programmes on health outcomes.

Financial viability

Two levels of programme affordability can be determined: first, the affordability of the overall health programme to each party responsible for providing financial support or other inputs to the programme, and secondly, the affordability of proposed services and activities to their intended beneficiaries. There is, of course, an overlap between these two considerations whenever cost-recovery from the patients or beneficiaries occurs. This, however, does not diminish the need to conduct the analysis from both points of view. With respect to affordability to sponsoring parties, the financial viability of the system in terms of the anticipated patterns of expenditures for both capital or investment activities and recurrent or operational activities should be determined and compared to actual expenditure patterns and projected revenues. Any major increase in the level or pattern of funding, as in the case of the introduction of a new programme, needs to be justified to protect financial viability.

There are numerous examples where even a rudimentary analysis of the overall financial viability was omitted. For example, a village-level programme of latrine construction and water source protection was developed in Cameroon. Programme objectives were set on the basis of identified needs and a village health committee was constituted to direct implementation. At the end of the implementation period somewhat less than one third of the project objectives had been attained. A retrospective economic and attitudinal survey of the project indicated that the project's total capital cost exceeded by some 15 per cent of the total income at the disposal of the village, after deducting from total revenues only those expenditures necessary to meet their basic needs. 7/ It was therefore impossible for the village to carry out the project as conceived, even if all the income at its disposal were to have been allocated to the sanitation programme. A recommendation to reduce project costs by some 15 per cent to bring it in line with the income at the village's disposal would still have been an unrealistic target, given the existence of other demands on that income. Thus, a commendable financial effort to implement the project was regarded as a failure because programme expectations were set at unaffordable levels. Moreover, the project failed to identify the sources and amounts of community funds that would be required in later years to maintain the latrines and protected water resources.

In the determination of a programme's financial viability, care needs to be exercised to identify the full cost of all inputs and to ensure that some party has been given the responsibility for providing each input. Failure to do so risks compromising programme execution. An example is provided by the Gossas village health programme in Senegal, under which drug distribution to village health workers was to be performed by the health post nurse using a donkey cart for transportation. 8/ Under the project, the cart was provided by a foreign donor and the donkey by the community. However, no one was explicitly made responsible for feeding the donkey, which turned out to be very costly when compared to the nurse's salary, to the value of drugs to be transported and to the health budget of the local community which was to receive the drugs. As a result, the carts remained unused until a different transportation arrangement was worked out. Under the modified system, villages desiring to receive drugs were to send one of their donkeys to the health post to collect the drugs. This example also serves to draw attention to a financial requirement that is often overlooked: the need to amortize capital investment - in this case the donkey and the cart - in order to accumulate funds for their replacement.

From the vantage point of the intended beneficiaries, it is of paramount importance to determine whether financial charges or other access costs are affordable and reasonable in relation to the service provided and to the household budget. Contributions to both capital and operating expenditures should be examined. If these financial charges result in an excessive burden for the average household or for a significant segment of a programme's intended beneficiaries and if a sufficient share of these charges cannot be shifted to another source of financing, then the proposal, although technically feasible, must be considered financially unviable. In some situations, it may not be sufficient to carry out this analysis at the household level. For example, utilization rates for maternal and child health care services, particularly when user charges are levied, tend to be more closely linked to the discretionary authority women have over household funds than to total household income. Indirect corroboration of this relationship can be found in a sociological survey on the utilization of health services in the Ivory Coast; 9/ which revealed that male consultations at local dispensaries accounted for over three quarters of all consultations even though epidemiological surveys showed that women and children accounted for over three quarters of all disease episodes. Many similar observations support the notion that the affordability of maternal and child health programmes should be examined in the context of the housekeeping budget entrusted to the women rather than the total household budget.

In the conduct of the financial viability analysis, it is useful to examine other effects such as substitution and complementarity among health services and health expenditures to determine whether the introduction of a new programme or service will reduce or displace demand for traditional health services or, on the contrary, increase demand. Traditional health providers are influential in shaping public attitudes towards modern health services and usually are the recipients of a significant share of total health expenditures. For example, the introduction of health services that effectively reduce the demand for services provided by traditional healers and, simultaneously, of user charges that are lower than the value of payments made to these healers may actually serve to increase the level of care a household can afford to purchase. A different consideration is raised by seasonal variations in income patterns that may imperil a technically viable programme. For example, financing a malaria control programme by levying community contributions shortly before the start of the rainy season may be appropriately timed for technical reasons, but may not be financially affordable if payment is required before the planting season rather than after the harvest, when income is produced.

Service pricing

Affordability and service pricing issues play a key role in determining not only service utilization but also service misutilization rates. These issues are central to equity considerations arising out of subsidized payment for services and to social issues of private and public good. Cost-recovery mechanisms, in addition to raising revenues, have an impact on the behaviour of users and providers of health services. If service payment is required, users will seek services to the extent they perceive that benefits outweigh cost. Payment effectively constraints run-away demand that results from free provision of a desired good. It also tends to displace other rationing mechanisms. However, the introduction of service payments may have negative effects. One almost inevitable consequence is that some of those needing health services may find that the level of pricing has effectively denied them access. Secondly, because of imperfect knowledge of health problems among consumers and service providers, requiring payment for the treatment of certain health risks or disease states that may not be recognized as such would be counter-productive, violating the purpose of the programme. An example can be drawn from populations living in areas where vesical schistosomiasis (from S. haematobium) is endemic and where the presence of blood in the urine of boys, instead of being regarded as a symptom of disease, is an eagerly anticipated event, predicting the arrival of puberty. Other examples include malnutrition and anaemia. In these instances, a full subsidy or even financial incentives (negative pricing) to gain programme acceptance may be justified until disease perceptions are changed. Thirdly, special pricing arrangements may be required where effective care necessitates periodic visits, such as for the control of tuberculosis and leprosy or for ante-natal, family planning and childhood immunization services and repeated anti-helminthic mass treatments. In many cases a single or a periodic fee giving the beneficiaries the right to consultations and treatment over a specified time period may prove to be the most appropriate form of payment, particularly if there are large seasonal variations in income at the disposal of the beneficiaries.

In addition to price barriers, the introduction of user charges can inject biases into the way services are utilized. User recourse to services will vary in response to the manner in which services are paid for: a self-insurance scheme with periodic assessments, consultation fees per disease episode or per visit to the service facility, the inclusion or exclusion of drug dispensing in consultation fees. Furthermore the decision to impose a single rate or to impose multiple rates will influence demand for services. Experience in developing countries has shown that the ill are less likely to complete a prescribed course of treatment if drugs are sold by the unit rather than being included in the consultation fee. Under such a system, there will be a tendency for the ill to follow the prescribed treatment until the symptoms disappear or seem to be controlled. Including the cost of drugs in the consultation fee, however, presents other drawbacks by discriminating against treatments that do not require medication or are less costly to provide and by failing to discourage overprescription of drugs or substitution of a more costly treatment on the part of the health provider. Overprescription of all kinds - i.e. antibiotics for minor illness and selection of brand name drugs when inexpensive generics may be substituted - is a problem in developing countries as well as industrialized nations.

Service pricing arrangements can also lead to social or equity dilemmas. For various reasons, the principal target groups of public health programmes are most often found among the lowest socio-economic groups. These are the households that are most likely to be the first to suffer from rationing effects or denial of access when service costing is introduced. Exacerbating this dilemma is the fact that it often requires significantly higher unit costs to reach these groups effectively, particularly when outreach programmes or home visiting are called for. Now, when we consider that these groups are also likely to be underrepresented in the political process, it can be seen that a decision to place service pricing within the competence of community-based and community-managed health schemes could lead to serious conflicts between financial considerations and health objectives. In most cases, resolving the conflict will require a decision from a higher political level either to subsidize the service or to drop it altogether.

Indirect price barriers should also be considered. A good example is provided by a nutrition education programme that required mothers atending the course to bring some powdered milk to the demonstration. 6/ The cost of purchasing this "requirement" prevented the poorest households from participating although they were greatest in need of assistance. Replacing the "requirement" for milk by one for beans or another low-cost source of vegetable protein would have permitted the families most in need of nutritional education and advice to gain access to these services.

As a final consideration relating to service pricing, it should be noted that non-financial considerations may lead a community to prefer paying for certain services rather than receiving them free of charge. After the successful introduction of community-supported primary health care in the Pikine, the health committee refused to participate in an expanded programme of immunization (EPI) being developed by the Ministry of Health. 6/ Under this programme, government health officials would have delivered immunizations free of charge in the project area. The village health committees made a counter-offer to purchase the vaccines from the EPI programme, at cost, provided they would be allowed to organize delivery and charge a nominal fee and be permitted the option of procuring vaccines from other sources if sufficient supplies could not be provided by the Ministry in a timely manner. Several considerations contributed to the committees' turning down the government offer: a desire to retain control of all basic health activities through control of all expenditures, an appreciation of the risk of poor programme performance and poor logistical controls that were associated with other government health programmes, and a pride in the community's ability to direct primary health programmes. This desire to charge a nominal fee for what was widely regarded as an essential health activity is a reflection of the maturity reached by the committees in coming to grips with issues of financial system management, economic choice in the market place and behavioural psychology. This illustrates the multiplicity, complexity and variability of community objectives and attitudes that can have a major impact on health outcomes. It also illustrates the importance that must be attached to previous experience in management in assessing self-financing schemes and the need for detailed and situation-specific analysis to be able to forecast accurately the acceptability and eventual utilization of health programmes.

Cost effectiveness

Financial analysis can be used in conjunction with epidemiological and attitudinal data to assess the most efficient or least-cost solutions to health objectives. The process involves minimizing the cost of individual services and optimizing their mix, a complex task well described in the existing literature. 10/ In the application of this methodology to projects in developing countries special consideration must be given to a number of factors:

A thorough review of all costs is imperative. The failure to include costs, such as feeding the donkey in our previous example, could seriously distort the relative efficiency of programmes or alternative delivery mechanisms being considered. Particular care is therefore needed to ensure that all costs are captured, including indirect costs of support services essential to proper implementation, such as expenditures for supervision and referral. A complete cost-effectiveness analysis should also take into account the costs arising out of misutilization and non-utilization of services.

It is important to examine carefully all project components for less costly alternatives. Substantial savings can often be made in areas that are commonly overlooked. For example, the overall costs of meeting transportation needs can often be reduced by limiting the use of fleet vehicles that are costly to operate and by maintaining and instituting use of public or private transportation. Personnel expenditures are often inflated by allowances and incentive payments that may no longer be necessary. Eliminating such payments whenever administratively feasible can also lead to significant savings. The strenuous resistance and negative psychological impact of making such cuts suggests that great care should be exercised before introducing incentives or supplemental payments into pilot schemes and that analysis of a scheme's replicability should assume that any incentives introduced under the scheme will end up being generalized. Indirect benefits should be estimated. For example, treating village elders for discomforting but non-life-threatening diseases, such as non-strangulated hernias or hydrocele, can have a beneficial impact on how health services are used by the community. The benefits of such activities relate not to their health impact in averting morbidity but to the credibility and inducement to health service use that the elders can provide. Technical and management training activities fall into a similar category.

Factors that reduce provider and/or user compliance can have a very significant effect on the ultimate cost-effectiveness of programmes and activities. This arises from the multiplicative relationship of the factors entering into the definition of effectiveness: 10/

$$\text{Effectiveness} = \begin{array}{c}\text{Clinical}\\ \text{efficacy}\end{array} \text{ X } \begin{array}{c}\text{Population}\\ \text{coverage}\end{array} \text{ X } \begin{array}{c}\text{Provider}\\ \text{compliance}\end{array} \text{ X } \begin{array}{c}\text{User}\\ \text{compliance}\end{array}$$

Financial arrangements that reduce either or both of the latter terms can therefore significantly limit the true effectiveness with which health programmes can be implemented. For instance, if provider and user factors could both be increased from 50 per cent to 70 per cent the total effectiveness of the programme would almost double, while if financial arrangements were such as to reduce the two compliance factors from 50 per cent to 30 per cent, the total effectiveness would be reduced by almost two thirds.

CONCLUSION

We have drawn attention to some of the considerations that have led us to assert that financial analysis is a necessary discipline in assessing the viability of health projects. Numerous examples have been cited to indicate that failure to consider economic motivations at the project level imperils project function. To indicate a positive approach, we have given examples of the useful information that can be developed in a project, but this list of data is not intended to be all inclusive or prescriptive. Actual requirements are related to the scope of the envisaged health programme and need to be related to ongoing expenditure patterns in health and other related sectors. For small innovative projects much of the required information can be cheaply or informally obtained. However, if the intention is to extrapolate experience from an experimental project on a larger scale or to design new components of a national health system, a more rigorous examination of financial issues is essential. Important goals in financial and technical analysis are: to avoid costly mistakes, to reduce service costs, and to make indigenous populations increasingly responsible for improving their health status.

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Annex

Data Requirements for Primary Health Care Programmes in Pikine Project and for National Replicability

REQUIRED INFORMATION	INFORMATION COLLECTED	SOURCE OF INFORMATION	REQUIREMENTS FOR NATIONAL REPLICABILITY
I. EPIDEMIOLOGY			
1. Disease patterns and Population at Risk	10 leading causes of outpatient consultations - by age group - by season Epidemiological patterns of most prevalent diseases diseases not present Effective population coverage of health facilities	M.D. Doctoral Thesis - Study of Morbidity and Mortality in the Project Area by Medical Director of Project Assessment of Coverage Effectiveness-conducted by Medical Director with help of volunteers Data from patient registries of well-attended private dispensaries in project area	National Epidemiological Assessment providing mortality and morbidity patterns by age group, preferably based on epidemiological survey or national health statistics. Population coverage by various levels of health facilities and regional variations
2. Means of Intervention	Classification of health problems to be addressed through - delivery of health services - health education programmes - sanitation programmes For health services determines - list and price of essential drugs - standardized treatment schedules	Study by Universities of Dakar and Leiden (also included data on health infrastructure) Meetings with Project Steering Committee Costs provided by Central Pharmacy Review of technical literature on appropriate treatments for specific diseases	National, Regional and Urban/Rural Assessments of - nutritional status and problems - fertility patterns - access to water supply and sanitation Assessment of current health programmes

REQUIRED INFORMATION	INFORMATION COLLECTED	SOURCE OF INFORMATION	REQUIREMENTS FOR NATIONAL REPLICABILITY
II. HEALTH FINANCE			
1. Allocation of Health Expenditures in the Public Sector	Budgeted and Actual Expenditures in Project Area by: - major type of activity - level of facility - type of expenditure - (personnel, drug, supplies, maintenance, transport, construction equipment, etc.)	Health Centre Budgets and Accounts of Expenditure Health Association Accounts Accounts of the medical supply stores	National and regional budgeted and actual expenditures by Ministry of Health and other Government agencies: - Adequacy of budgetary allocations - Variance analysis of budgetary allocations - Seasonal patterns if any Analysis of cost-sharing and cost-recovery experience in health and other sectors
2. Project Financing Plan	Activities to be financed by Central Government, foreign donors and community - by level of facility - by type of expenditure - by major type of activity	Review of MOH Budgets for Province Review of technical assistance budgets Meetings with Government officials at central and provincial levels and with religious organizations involved in health care	Review of funding patterns at national and regional levels with Ministries of Health, Planning, Interior Review and coordination of Technical Assistance Programmes Financing plan for health sector activities
3. Budget for Community-Supported Activities	Application of funds raised through community participation	Discussions Medical Steering Committee Discussions between District Health Committee, project staff and community leaders plus technical assistance from a financial consultant	Sample survey to determine extent of community participation at each level of health facility and types of expenditures to be financed by community
4. Resource Mobilization	Ceiling for health expenditures per household Ceiling for emergency consultation fee that would be paid by someone other than head of household shortly before payday Resources mobilized for protocol clinics - including sensitivity analysis of cost recovery under alternative service pricing arrangements	Discussions with health providers community leaders, and random sample of households (about 1:100) in two clinic catchments areas Projections based on utilization rates for services. Data derived from disease incidence/prevalence data, anticipated service levels and service pricing policies	Survey of health-related expenditures as part of household income and expenditure survey Study of financial capacity to meet medical expenses - in urban and rural areas - at different times of the year - for different socio-economic groups
5. Affordability of Services Provided at Cost	Identification of groups unable to afford standard payment scheme (based on consultation fee)	Meetings with Community leaders Data from sample surveys on non-utilization of health	Identification of households, population subgroups unable to afford purchase of health services. (Part of household expenditure survey)

REQUIRED INFORMATION	INFORMATION COLLECTED	SOURCE OF INFORMATION	REQUIREMENTS FOR NATIONAL REPLICABILITY
III. SOCIO-ECONOMIC			
1. Perceived Health Needs and Priorities	Health Services desired - actually provided and not provided Characteristics of desired services	Meetings with Community leaders and Community itself	Sample based attitudinal survey to identify and prioritize health needs and responsible parties
2. Demand for Health Services	Utilization rates of existing private dispensaries Relative frequency of patient complaints and diagnosed health problems Reasons for non-utilization of services by Community	Data extracted from patient registers of well-frequented private dispensaries with adequate drug supplies Discussions with Community leaders and Community members to confirm patterns observed Sample survey of community on reasons for non-utilization carried out by medical student and community volunteers plus comparisons of patient records with disease incidence	Sample survey in representative areas of the country on utilization of present services. Identification of constraints to use and estimates of potential demand Sample survey to determine extent of community participation at each level of health facility and types of expenditures to be financed by community Socio-economic survey of incomes and expenditures at household level, including savings/investment capacity. To be conducted in representative areas and for representative socio-economic groups
3. Income and Household Expenditures	Not collected-no community financial participation in financing infrastructure		Socio-economic survey of incomes and expenditures at household level, including savings/investment capacity. To be conducted in representative areas areas and for representative socio-economic groups.

REQUIRED INFORMATION	INFORMATION COLLECTED	SOURCE OF INFORMATION	REQUIREMENTS FOR NATIONAL REPLICABILITY
IV. FINANCIAL AND MANAGERIAL CAPACITY			
1. Definition catchment area	Accessibility criteria Population Map of physical infrastructure	Extrapolation of data on utilization of health facilities plus discussion with Community leaders in each clinic catchment area Discussions with Community leaders Mapping carried out by Army	Recent census data or other data on settlement patterns
2. Accounting and Reporting	Charts of accounts and book-keeping/ accounting and reporting procedures arrangements	(No previous experience at village health committee level. System and procedures established in close and consultation with Community leaders and local and central authorities)	Study of accounting and reporting procedures Study of administrative law and procedures
3. Internal Control and Audit	Internal controls used to monitor use of funds Auditing procedures to verify accounts	-Same as IV.2 above-	Study of audit procedures and statutory requirements (expenditure survey)

D. Introductory remarks on health policies and their effects on mortality in developed countries

Minoru Muramatsu*

Japan is a country which has shifted rather recently from the status of developing to that of developed nation, and therefore it has fresh experiences in both situations. It is, however, a unique case in certain aspects, as is indicated in the background paper entitled "Mortality and health policy: highlights of the issues in the context of the World Population Plan of Action" (chap. I.A of the present document).

A most pronounced characteristic of the division between developing and developed countries in terms of health policies and programmes is where the most serious national concern lies. In developing countries, Governments are keenly interested in the reduction of mortality as quickly as possible. In developed countries, however, mortality levels in general are already so low that their further reduction is not regarded as urgently important; instead, government authorities are concerned with morbidity problems, especially because they are so closely related to the aging of the population, which is a demographic issue common to the entire developed world.

During the period from 1920 to 1940 Japan was in the stage of a pre-modern nation. Crude death rates were in the range between 25 and 17 per 1,000 population. Expectation of life at birth was less than 50 years. The infant mortality rate per 1,000 live births declined during this period from a high of 166 in 1920 but still stood around 90 in 1940. The major causes of death were such diseases as pneumonia, bronchitis, gastro-enteritis and tuberculosis, while cerebro-vascular diseases and senility were far less important. Fertility rates were also high, on the order of 30 to 36. Japan presented a typical picture of a developing country.

A rapid transition followed, and during the 20-year period from 1960 to 1980 the health profile of the country became characteristic of a developed country. Crude death rates were six to seven. Expectation of life at birth was prolonged to 73 years for males and 79 years for females in 1980. Infant mortality dropped to eight. There was a complete change in the major causes of death, with the result that malignant neoplasms, cerebro-vascular diseases and heart diseases together accounted for more than 60 per cent of all deaths. The birth rate in 1980 was 14, and the average number of children per couple became less than two.

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During the former period, 1920 to 1940, the main concern among health authorities was to control infectious diseases, acute as well chronic, and the programme against tuberculosis was by far the most important single health activity. Mortality rates in rural areas were higher than the corresponding levels in urban areas. Nutritional deficiencies, especially of vitamins, were also a problem calling for immediate action.

During the latter period, 1960 to 1980, on the other hand, mortality became no longer a matter of grave concern. Attention was now focused on how to cope with the growing volume of degenerative diseases, such as cancer, heart disease and hypertension, together with the increase in the incidence of traffic accidents, diabetes mellitus and obesity. Health policies and programmes necessarily have come to be linked with the problem of increasing medical expenditures and financial assistance for the aged.

Japan has undergone a very rapid transition during the past several decades. Hence, a few points from the Japanese experience may be of more interest and value to developing countries than a detailed description of the problems that are common to developed countries, since those problems are dealt with extensively in the background paper already referred to. The author hopes that the following points will be useful to developing countries in determining their own health strategies.

It is obvious that the Government and the people at large in Japan - as in any developing country today - were desirous of reducing mortality rates as quickly as possible. Government efforts along this line were taken for granted. In fact, however, no numerical, demographic target of mortality reduction, such as the one presented in the World Population Plan of Action, was prescribed in Japan. Nevertheless, mortality rates began to decline relatively early, around 1920. A most significant factor conducive to this trend was a remarkable improvement in general education. Higher education was regarded as the most valuable personal asset, and the Government invested heavily in universal education. With the rise in educational level, demands grew rapidly for medical services, at the initiative of the people themselves, and the level of personal hygiene was improved significantly. Thus, one fact that might be learned from the Japanese experience is that health programmes _per se_ would not have accomplished much if they had not been supported by concurrent social development policies and programmes. In regard to the efficacy of primary health care programmes, it has been suggested that the effectiveness of the technology-oriented approach is necessarily limited and that the programme must be backed up by social and economic development measures. The past experience of Japan appears to be a case in point in this connection, for it demonstrates that health programmes are indeed a part of overall development programmes. Enhancement of the level of general education certainly has played a key role.

Political leaders, national leaders, social leaders: all these leaders usually put the highest priority on economic development. They will admit the importance of health, if asked, but in their routine planning and decision-making, health programmes are treated as secondary. That is perhaps because the improvement of health is just a matter of common sense - so much so that nobody discusses it unless specifically required to do so. That was the experience of Japan in the early years. When the total national budget was limited, funds allocated for the production of goods received top priority while the health budget tended to be sacrificed. In the circumstances, it was often necessary for health people to develop strategies in order to persuade the authorities concerned to establish concrete health programmes and allocate the appropriate funds in the budget. For example, it was advocated that the improvement of physical efficiency not only was a value in itself but also was a definite economic gain, since healthy manpower would imply less absenteeism and more production of goods within an enterprise. Thus, while it is perfectly understandable that health people claim the value of health as such, efforts are needed to translate the claim into language that appeals to other groups if contemplated plans are to be transformed into action supported by the necessary budgetary appropriation.

In an analysis of the long-term declining trend of mortality in Japan, there can be no doubt that such factors as the expansion of medical services throughout the country, the introduction of new drugs, the development of new medical techniques, the application of antibiotic and the progress in immunization programmes have all played a significant role. Without these developments in medical technology, progress would have been quite slow, if not altogether impossible. At the same time, however, it should be admitted that other measures which are not explicitly related to medical technology itself, such as the improvement of environmental sanitation, the development of water supply and sewage disposal systems, or, more broadly, even the increase in per capita income, have remarkably facilitated the whole process of mortality decline. An exact evaluation of the role played by these interventions is lacking, but to disregard this important element and to ascribe all the credit to technological manipulations would be a gross mistake. We ought to admit that health is, after all, an inseparable component of the overall social and economic development in society.

Looking back at the entire period under observation, one recognizes the fact that emphases in health policies and programmes in Japan have undergone certain changes in accordance with changes in the social and economic milieu of the country. In earlier years, the major emphasis was apparently on the curative side of medicine. Attention was directed to meeting the immediate needs of those who were suffering from diseases, impairments and injuries. With the growing availability of such curative services, people gradually came to appreciate the value of medical services, which, in turn, played an important role in paving the way for the next stage, where the idea of prevention was emphasized in addition to the treatment of disease. Also, in more recent years, the scope has been further expanded to include another new idea: the promotion of health. Thus, all in all, development has moved in due order, from cure to prevention and from prevention to promotion of health.

Nothing is particularly new in that description. In fact, this has been the very usual pattern of development in all developed countries. It does say one thing, however, which may be relevant to those developing countries which are so eager to build up advanced medical and health systems within a short span of time. Because of the current tendency throughout the world to put so much emphasis on prevention and health promotion, developing countries may wish to build up their programmes on all these fronts, trying to cover everything from the very beginning. At least from the Japanese experience, it seems that such an overambitious approach may not necessarily be wise. It would be more realistic to plan a national health programme following a certain sequential order in its emphasis. This seems to be particularly important in view of the usual limitations on the health budget within the total national budgetary appropriation. This, of course, is not intended to depreciate the value of prevention of disease or promotion of health - they are no doubt very important - but, rather, to suggest that a programme should be staged realistically and that "to jump the queue" may not lead to a fruitful enterprise. In any event, it is essential to meet the immediate needs of the people if one is interested in selling an idea; lofty ideas can be taken up after the basic requirements have been more or less met.

In regard to the question of the single, disease-specific approach versus the multiple approach in the health programme, Japan's past experience gives an example of a gradual shift from the single to the multiple programme. In the early stage of development, when infectious diseases were of major concern, between 1920 and 1940 the single, disease-specific approach was by far the most common practice. Typical of this practice was the tuberculosis control programme, in which the Japanese Government took an enormous interest. Mass screening with flurography, diagnosis with X-ray, tuberculin testing, inoculation with BCG - all these measures were pursued vigorously, and their effects on mortality were remarkable. The programme acted as a powerful instrument in bringing about a nationwide understanding of how much a health programme could really accomplish. As Japan moved into the state of a developed country, and as its national health profile changed significantly, current health programmes were oriented toward the multiple approach to a great extent. Comprehensive health care programmes are now envisaged in accordance with the different needs arising from various stages in the life cycle. The national health care scheme for the aged which was formulated recently by the Government represents an example of this.

Thus, health programmes seem to be very closely related to the stage of development of the country. The selection of the possible approach is of necessity determined by the requirements arising from the prevailing societal conditions. Public health can be public health in its genuine sense when it works as a built-in element in the total national development process.

IV. TECHNICAL CO-OPERATION AND ASSISTANCE

A. Technical co-operation in the field of mortality and health policy

United Nations Secretariat*

INTRODUCTION

The main objective of this paper is to review briefly and analyse the technical co-operation efforts which have been undertaken by the United Nations Department of Technical Co-operation for Development (DTCD) to contribute to combating the high mortality levels that still persist in many developing countries and to help evolve policies in this respect in response to the World Population Plan of Action resulting from the World Population Conference in 1974. 1/

In the debate that preceded the adoption of the Plan of Action during the Conference, the need for increased international co-operation was stressed by many speakers, who pointed out that "the demographic and related processes of nations often had repercussions which went far beyond national boundaries and had major global implications" (para. 66). This implied interrelationship between national demographic dynamics and international well-being was frequently referred to in the Conference's discussion of the role of international technical co-operation in controlling mortality and more specifically maternal and infant mortality. It is also clearly exemplified in the "Recommendations for Action" of the Plan of Action, which state, *inter alia*:

> "The reduction of morbidity and mortality to the maximum feasible extent is a major goal of every human society. It should be achieved in conjunction with massive social and economic development. Where mortality and morbidity rates are very high, concentrated national and *international efforts should be applied to reduce them as a matter of highest priority in the context of societal change*" (para. 20) (emphasis added).

The main thrust of international co-operation even in the post-Conference era has continued to be through action programmes to control death and disease by the transfer of medical technology and, more importantly, by providing drugs, medical supplies and related equipment under the aegis chiefly of the

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World Health Organization. Nevertheless, what has not been lost sight of from the very beginning is the improvement of the quality of life as a long-term goal, which requires that action be co-ordinated in all major socio-economic fields, including population; this goal is seen as attainable, in the field of mortality and morbidity as in others, for international well-being through "increasing international activity in research, the exchange of information, and the provision of assistance on request" (para. 15). Thus, although primary emphasis has remained on medical programmes, there has been increasing recognition in the post-Conference era of the need: (i) to develop national skills in all aspects for dealing with mortality and health policy; (ii) to collect and maintain a continuous record of mortality and morbidity levels and structure and their response to measures taken for improving them; and (iii) to define and analyse the basic interrelationships which exist among demographic, health and socio-economic variables on which long-term policies may be firmly grounded. This is the context in which the mandate of DTCD in the area of population has gained importance and increasing emphasis.

DTCD's technical co-operation activities in this field, which gathered momentum in the post-Conference period, centred round the three areas just mentioned, but dealt specifically with the collection, analysis and interpretation of data, the integration of the results of these activities into population policy formulation in ways compatible with development planning ideologies and goals, and the training and development of skills among the nationals of developing countries in all these fields to assist them towards achieving self-reliance.

WORLD MORTALITY SITUATION ON THE EVE OF THE CONFERENCE

In the debate that preceded the formulation of the World Population Plan of Action, there was, unlike that in regard to fertility, unprecedented unanimity with regard to the strategy needed to combat mortality and morbidity in view of the critical nature of uneven declines in the mortality levels of developing countries.

The results of the United Nations Second Inquiry among Governments on Population and Development 2/ conducted during 1972-1973 had brought into focus the world mortality situation as it was on the eve of the 1974 World Population Conference - that is:

(i) Progress in reducing mortality had been greater between 1935-1939 and 1950-1955 than between 1950-1955 and 1965-1970. Although there had been faster progress in the less developed regions than in the more developed regions, thus narrowing the gap between them, the discrepancy was still unacceptably high. Thus, for example, while the difference in the expectation of life at birth between the less developed regions and the more developed regions was 20 years, that between Europe and Africa was 28;

(ii) In the more developed countries, traditional/conventional health services were no longer guaranteeing any substantial further increase in life expectancy;

(iii) In some developing countries, in spite of a rapid decline in general mortality, the expectation of life at birth for women was lower than that for men owing to high childhood and maternal mortality risks;

(iv) With respect to improvement in infant mortality, the less developed regions were still lagging far behind the more developed countries, and the differential infant mortality rates among the developing countries themselves were unacceptably high.

The above characteristics are reflected in the statistics relating to the expectation of life at birth in the developing countries. In mid-1974, as indicated in the Plan of Action, the "average expectation of life at birth [was] 63 years in Latin America, 57 years in Asia, and only a little over 46 years in Africa, compared with more than 71 years in the developed regions. Furthermore, although on average less than 1 in 40 children [died] before reaching the age of one year in the developed regions, 1 in 15 [died] before reaching that age in Latin America, 1 in 10 in Asia and 1 in 7 in Africa. In fact, in some developing regions ..., average expectation of life at birth [was] estimated to be less than 40 years and 1 in 4 children [died] before the age of 1 year" (para. 5). It is hardly surprising, therefore, that the reduction of mortality, and particularly the reduction of infant mortality, was agreed upon unanimously at the Conference as one of its most important and urgent goals.

Added impetus to wage a concerted attack on mortality came also from the consensus at the Conference that the enormous short-term instability that mortality reduction imposes on population growth is symptomatic of the early development process and must perforce, in that context, be viewed as beneficial and that "sustained reductions in fertility have generally been preceded by reductions in mortality" (para. 21). As a result of this unprecedented meeting of minds, the following recommendation was included in the World Population Plan of Action:

> "It is a goal of this Plan of Action to reduce mortality levels, particularly infant and maternal mortality levels, to the maximum extent possible in all regions of the world and to reduce national and subnational differentials therein. The attainment of an average expectation of life of 62 years by 1985 and 74 years by the year 2000 for the world as a whole would require by the end of the century an increase of 11 years for Latin America, 17 years for Asia and 28 years for Africa."
>
> "It is recommended that national and international efforts to reduce general morbidity and mortality levels be accompanied by particularly vigorous efforts ..." (paras. 22 and 24).

The World Population Plan of Action also detailed a strategy designed to achieve these goals which was heavily weighted in favour of actions in the area of health and nutrition directed especially towards high-risk populations.

ROLE OF TECHNICAL CO-OPERATION IN THE WORLD POPULATION PLAN OF ACTION

In view of the Conference's unanimous recognition that "international efforts should be applied", the Plan of Action assigned a critical role to international co-operation and defined it as follows:

> "International co-operation ... should play a supportive role in achieving the goals of the Plan of Action. This supportive role could take the form of direct assistance, technical or financial, in response to national and regional requests and be additional to economic development assistance, or the form of other activities, such as monitoring progress, undertaking comparative research in the area of population, resources and consumption, and furthering the exchange among countries of information and policy experiences in the field of population and consumption. Assistance should be provided on the basis of respect for sovereignty of the recipient country and its national policy" (para. 100).

Although mortality levels crucially affect the size and structure of their populations, Governments consider policies in this area to be primarily health and social welfare rather than demographic ones. In 1980, 107 Governments out of a total of 165 considered the average life expectancy at birth in their countries as too low. Of these 107 Governments, 98 were in developing countries. 3/ All Governments desire a reduction in their countries' morbidity and mortality levels and all have embarked on measures aimed at achieving these objectives.

FACTORS THAT HAVE DETERMINED INTERNATIONAL TECHNICAL CO-OPERATION IN MORTALITY AND HEALTH POLICY

The two strongest factors that have affected the flow of technical co-operation between the developed and developing countries in the post-Second-World-War period have been: (i) the revolution in medical technology in terms of speed of progress in innovations and decline in costs for transferring the technology from developed to developing counties; and (ii) the relative ease with which co-operation is offered and accepted owing to the common desire to reduce mortality and prolong life among all cultures, religions, political ideologies and systems, socio-economic classes, ages and sexes. Both those factors have been responsible for a dramatic favourable response to technical co-operation efforts, in terms of measurable indicators of mortality.

While in the wake of the early 1970s the response of fertility to socio-economic development was relatively clear, and the prior experience of the developed countries with respect to the factors apparently determining fertilty as well as the strength and direction of correlation between these factors and fertility indices could provide some guidance for technical co-operation efforts in the field, the experience of developed countries with respect to mortality trends was not able to provide such clear models for emulation. In some less developed countries, for example, there has been a weakening of the positive association between mortality improvement and urbanization. 4/

PARTNERS IN TECHNICAL CO-OPERATION

As mentioned above, even in 1980, i.e., five years after the Plan of Action went into effect, there were as many as 107 Governments which considered that the expectation of life at birth in their countries was low, implying thereby that special efforts were needed to arrest morbidity, check mortality and develop an opposite health policy in these countries. A majority of these countries have, in fact, been beneficiaries of international technical assistance in these fields. At the same time, during the post-Conference era the number of agencies that have provided financial and/or technical assistance has kept increasing and had reached nearly 50 by 1982.

They are distributed as follows: 5/

United Nations agencies	5
Regional economic commissions	3
Bilateral assistance agencies	6
Non-governmental organizations	35

The bulk of international technical co-operation in this field was provided by three major United Nations agencies, namely, the World Health Organization (WHO), the United Nations Children's Fund (UNICEF) and the United Nations Department of Technical Co-operation for Development (UN/DTCD), either from their regular budgets or from funds provided by the United Nations Fund for Population Activities (UNFPA). However, in areas related to mortality and health policy, other than the provision of large-scale medical and health services and medical research (much of which was financed by WHO and UNICEF out of their regular budgets), the major funding agency has been UNFPA. During 1975-1982, of the projects supported by UNFPA for funding, nearly 50 per cent were implemented by UNFPA, WHO, UN/DTCD and UNICEF, 39 per cent by governmental agencies and approximately 11 per cent by non-governmental organizations. 6/ Although it is hard to estimate the exact proportion of technical assistance that was provided directly in the fields related to mortality and health policy out of a total of 1,984 projects implemented during the period 1975-1982, a rough analysis based on data pertaining to projects implemented by UNFPA, WHO, UNICEF and UN/DTCD indicates that over 40 per cent of the projects were related to different aspects of mortality and health policy. This, then, is a gross indicator of the interest of the developing world on the one hand and of international response on the other in dealing with issues related to mortality and health policy in the post-Conference era.

Although the governing councils of all the United Nations agencies mandated to undertake technical co-operation activities have maintained that each agency must ensure close collaboration with others in the system in implementing project work programmes, the extent of such teamwork has been limited. There is no doubt that resources expended on technical co-operation will go much further if better channels of communication can be established for the exchange of information and for reaching mutual understanding of, if not definite agreement on, the strategies that should be employed in different aspects of technical co-operation and interdependence among the agencies, notwithstanding the formal division of labour resulting from the funding agency's selection of a particular agency for implementing a project. This, then, is an area where much still remains to be done in the best interests of technical co-operation in developing countries through United Nations channels.

FACTORS THAT HAVE GUIDED TECHNICAL CO-OPERATION ACTIVITIES IN MORTALITY AND HEALTH POLICY

The following are some of the factors which have guided technical co-operation in mortality and health policy in the past decade:

(i) Targets set by the World Population Plan of Action: The Plan of Action established the attainment of an average life expectancy of 74 years for the world as a target by the year 2000. While the developed countries may exceed this level, the United Nations projections indicate that by the year 2000 the developing countries may reach an expectation of life at birth of only 63 or 64 years. 7/ Thus a difficult task lies ahead both for the developing countries and for the international community which accepted the challenge thus implied.

(ii) Recommendations of the first United Nations Symposium on Population and Human Rights, held in 1974 in preparation for the World Population Conference: These recommendations called the attention of the international community to the vital role international organizations and the United Nations in particular, have to play in assisting Governments to implement their population policies with due respect for human rights, which has particular relevance to issues related to morbidity and mortality, be it mortality differentials, starvation, genocide, danger of nuclear holocaust, or the right to die with dignity. 8/

(iii) A slowing down in the rate of decline in mortality: This slowing-down process suggests that unless access to health and medical care is made available in the rural and outlying regions of many countries further reductions in mortality may be difficult to achieve. 9/ The slowing-down process has also underscored the need to monitor the process employed in raising the expectation of life at birth and to determine the critical socio-economic and cultural variables that control this indicator, such as women's education. There is extensive evidence which indicates that maternal education plays a major role in influencing infant and child mortality, presumably reflecting personal health behaviour and care, and access to and use of medical facilities. "It was found in Latin America that the probability of death between birth and age two years declined almost linearly with increase in the level of mother's education. Children of illiterate women had a risk 3.5 times that of children whose mothers had 10 or more years of education". 10/ Thus, learning from experience and using it in programme formulation and implementation in different countries is another step that has provided guidance for technical co-operation activities.

(iv) Increasing realization based on hard proof of the synergistic role played by health and other developmental programmes in reducing mortality.

Owing to the specific mandate assigned to the population programme to be implemented by UN/DTCD, the three factors enumerated in the Introduction to this paper as guiding the activities of UN/DTCD took the following concrete forms: (i) assistance in the organization of data sources, data collection, data processing and tabulation and analysis, and interpretation of the results of such analysis; (ii) assistance in using the results of the analysis in population policy formulation with a view to making such policies compatible with development planning targets; and (iii) assistance in training and transfer of technology to nationals so as to promote self-reliance in the skills required for carrying out all the tasks implied under items (i) and (ii) above, and in building local infrastructure to further propagate such training.

DEMOGRAPHIC DATA COLLECTION, PROCESSING, ANALYSIS AND INTERPRETATION

During the period 1975-1982, it is estimated that UNFPA allocated a total of approximately $118 million for demographic data collection, processing, analysis and interpretation to implement nearly 260 projects through United Nations technical co-operation programmes, which included not only the various technical steps in each one of these areas but also technology transfer and skill development on the job and, more importantly, institution-building in each country served in this respect. Their distribution was as follows:

Distribution of UNFPA-funded projects in the area of demographic data collection, processing and analysis 1975-1982 6/

Type of project	Percentage of total projects	Percentage of total budget allocated
1. Population censuses	48	60
2. Vital statistics registration	39	33
3. Demographic data collection and analysis from sources other than census and vital registration	13	7

Of the censuses supported with UNFPA funding, 66 per cent of the projects and 82 per cent of the total allocations made for censuses by UNFPA were implemented by UN/DTCD. Of the vital statistics registration projects 58 per cent, entailing 59 per cent of the allocation made by UNFPA for all such projects during the period under review, were implemented by UN/DTCD. Of the projects dealing with demographic data collection and analysis from sources other than census and vital statistics registration 29 per cent, using 18 per cent of allocations made by UNFPA for such projects during 1975-1982, were implemented by UN/DTCD. Although most of these 260 projects could not claim to have dealt with mortality statistics, a large number of them did, particularly those pertaining to civil registration systems and population censuses. It is, therefore, pertinent to examine technical co-operation activities that were actually carried out through these three types of projects.

One such activity relates to population censuses. Since the 1960s the United Nations has issued principles and recommendations for carrying out population censuses which are intended as a guide to help countries plan and conduct censuses in the best interests of planing for socio-economic development. In the section on "personal and household characteristics", account has been taken of the need to record data on mortality and some of its salient characteristics. Thus, among the "recommended and other useful topics" a question has been included on the number of surviving children among those born alive, to be asked of all women above a certain minimum age (such as 12 or 14).

Similarly, questions on maternal and/or paternal orphanhood, survival of first husband, and deaths (infant and/or of all ages) in the household during the census reference period have all been topics which the United Nations recommends for inclusion in census questionnaires, and appropriate technical support has been provided not only to structure the questions concerned but also to obtain the tabulations required to measure mortality indicators and differentials at the national and required subnational levels and by socio-economic classes, to analyse the data tabulated and to interpret the results.

An analysis 11/ performed for internal use by the Statistical Office of the United Nations Department of International Economic and Social Affairs of census questionnaires employed by some 166 countries in the 1970s and 40 countries in the 1980s shows that the distribution of the countries that asked questions to determine mortality indicators was as follows:

Distribution of countries that included questions on mortality in their censuses during the decades of 1970s and 1980s

Type of question	1965-1974		1975-1984	
	Number of countries	Per cent	Number of countries	Per cent
Number of surviving children among those born alive	67	40	21	53
Total number of deaths during 12 months prior to the census in the household	6	4	6	15
Total number of infant deaths during 12 months prior to the census in the household	4	2	2	1
Maternal orphanhood	15	9	3	8
Paternal orphanhood	9	5	3	8
Survival of first husband of eligible women	2	1	2	1

A regional breakdown of the countries that received technical assistance in various aspects of the population censuses which included one or more questions on mortality is as follows:

Regional distribution of countries which conducted censuses with United Nations technical assistance and included questions on mortality indicators during 1970-1982

Substance of question	Africa	Asia	Europe	Central and South America	TOTAL
Children surviving among those born alive	20	20	17	17	
Infant deaths in the reference period	1	2	-	3	6
Maternal orphanhood	8	-	3	6	17
Paternal orphanhood	7	-	2	1	10
Survival of first husband	-	-	2	1	2
All deaths in the reference period	6	-	1	2	9

As mentioned earlier, some of the ways in which countries were specifically assisted in the use of this data were:

(i) Data processing and tabulation: In this process not only could national and subnational indicators by demographic variables such as age, sex, civil status, urban-rural residence and migration status, and by socio-economic variables, such as literacy, education, occupational status, economic activity sector, etc. be measured, but also differentials by demographic and socio-economic variables could be established;

(ii) Evaluation, adjustment and analysis of data: In the latter part of the 1960s and in the 1970s, a large number of analytical techniques were developed whereby it is now possible to use census data, even data containing significant deficiencies and errors in geographic coverage and reporting, to derive mortality measures and to correlate them with socio-economic variables in order to determine the strength and direction of such correlations, to serve as a better basis for population policies compatible with overall economic development plans and targets. Perhaps the strongest support in technical backstopping of census analyses during the period under review was the provision of advice and other technical support to countries in using the emerging techniques of analysis. This was accomplished through fielding international technical personnel; establishing required documentation and reference centres and updating their acquisitions in the related areas for the use of personnel involved in analysis; developing of computer software for the analysis of such data; and preparing practical guidelines for analyses based on the experience with similar projects in other regions of the world. 12/ In most countries where technical assistance of this nature was provided, data obtained from censuses has had to be supplemented by data from sample surveys when such a source was available as well as by data from vital statistics registration systems which, in most developing countries, are as yet far from satisfactory, particularly with respect to statistics on deaths. Thus technical assistance was both challenging and fulfilling, especially when the results derived matched with those arrived at independently using other types of data. It must be pointed out to the credit of technical co-operation in this respect that a large number of countries which participated in this effort in the pre-Conference era and during 1975-1982 have already shown clear signs of self-sufficiency, and it is expected that the forthcoming censuses of the 1980s will witness increasing amounts of technical co-operation between developing countries (TCDC) with respect to data analysis and the interpretation of the results for policy formulation and planning.

With respect to technical assistance in establishing and/or reinforcing already existing vital statistics registration systems, a good deal of methodological research and its experimental application was strongly supported by international resources through most of the 1960s and the early part of the 1970s. In this process a significant amount of experience was gained to deal with deficient data or the collection of data in difficult social and geographical conditions. While the interest and expectations of the developing countries were accordingly raised in these areas, by the end of the 1970s both UNFPA and other bilateral sources had assigned a very low priority to this field. Thus the infrastructure and technical knowledge which had been built up in countries which needed further international technical assistance in these areas stood the risk of neglect if not complete abandonment at the beginning of the present decade. A close examination of this situation by the Expert Group on Mortality and Health Policy, with a view to making specific recommendations in this area, would be strongly advised.

In the area of sample surveys for mortality studies, infant and childhood mortality received much attention in international technical assistance. A round of comparable infant and childhood mortality studies was completed, including the West Africa sub-region (where such death rates are among the highest in the world), under the leadership of the demographic unit of the Sahel Institute and backstopped by the "Institut de formation et de recherche démographiques", a United Nations-supported regional training centre. Similar efforts were also carried out, with commendable success, in the regions of the Economic and Social Commission for Asia and the Pacific (ESCAP) and the Economic Commissions for Latin America (ECLA).

Surveys carried out and data analysed indicate that in the decade immediately preceding the Conference infant mortality rates had declined most rapidly in the more developed countries, in countries of East Asia and in an important number of other developing countries, such as several of the Arab nations in West Asia; in contrast, the decline was slower in most high-mortality countries, such as those of the sub-Saharan region. Maternal mortality, the reduction of which still eludes the efforts of health planners as well as demographers, was not given adequate attention in technical assistance for demographic surveys. This is an area where close working links between WHO and UN/DTCD can be particularly helpful. It is hoped that the Expert Group on Mortality and Health Policy will make concrete and constructive recommendations in this respect.

DEMOGRAPHIC TRAINING AND RESEARCH

During the period 1975-1982 UNFPA allocated over $20.5 million for technical co-operation projects in demographic training and related research. A number of United Nations agencies as well as UNFPA itself, governmental agencies and non-governmental organizations participated in implementing approximately 60 such projects. 6/ UN/DTCD implemented over a third of these representing an allocation of nearly $14 million. In addition to technical co-operation provided through such projects, which resulted in transfer of technology and skill and in institution-building, UN/DTCD implemented a dynamic programme of international training through United Nations fellowships, for which funds were drawn from two sources: funds set aside for fellowships within country project budgets, and funds amounting to over $1.2 million provided by UNFPA for a block allocation for population fellowships for international training of qualified nationals from developing countries. Besides these two sources of funding for international fellowships, the United Nations interregional and regional training centres and programmes also provided fellowships.

The United Nations programme in population training and related research may be divided into three principal categories: (i) the fellowship programme; (ii) the interregional training centres and programmes; and (iii) individual country programmes, which themselves encompass all or some of the following activities: (a) long- or short-term training and related student research programmes at the undergraduate and/or graduate levels; (b) related faculty/United Nations field personnel research; (c) related faculty/United Nations field personnel advisory services to Governments and others; and (d) shorter-term training activities, such as workshops, seminars, in-service training of various kinds and study tours.

Training through United Nations fellowships at other than United Nations Centres

During the period 1975-1982 several hundred candidates were trained through awards in the following main fields: demography, census organization and analysis, data processing, population statistics, vital statistics, economic and social demography, population and public health, and family planning. The study of economics, sociology, social anthropology, geography, mathematics, statistics and the like within the framework of this fellowship programme was permitted only if these subjects served as subsidiary to the candidate's major field in one of the approved population disciplines. Of these population disciplines, the ones that afforded major scope for the study of mortality, thus providing training to a significant number of candidates from developing countries, were demography, population studies and population statistics.

However, in the pre-Conference era when the United Nations fellowships programme in population was gaining ground, the most popular field of study was family planning, so that during 1970-1974 as much as 43 per cent of these fellowships were awarded for training in family planning. By the end of the decade nearly 95 per cent of the fellowships were awarded for training in demography, population studies and population statistics. A large number of these were tenable at specialized institutions and universities in the United States, the United Kingdom and countries of Western Europe, and at the graduate level only.

An analysis of the curricula of the more important of these institutions in terms of numbers of candidates trained during this period reveals that training in "demography", where the emphasis was on technical and quantitative aspects, invariably included fairly intensive treatment of all relevant aspects of mortality, whereas in "population statistics" the emphasis was placed more on data collection and evaluation techniques. Training in "population studies" provided a more substantive understanding of interrelationships between demographic and related socio-economic aspects. Thus of the total number of candidates trained under the United Nations fellowship programme (at other than United Nations Centres) approximately 75 per cent concentrated on the three specializations discussed above, and in so doing received varying degrees of training in understnding of the treatment of mortality as a population issue.

The thrust of technical assistance provided by the United Nations to the developing countries in this respect was to ensure that every candidate for whom a Government requested a United Nations fellowship was adequately qualified to undergo the proposed training; that such training was justified in terms of the country's needs; that the proposed institutions of training was the most appropriate; that the academic progress made by the candidate was acceptable; that the candidate returned to the position in the country that the Government had specially reserved for him/her, as agreed in the original nomination for an award; and, finally, that a follow-up of the candidate's professional activities would be undertaken a year after his/her return home. At the end of the decade of the 1970s UN/DTCD also undertook an in-depth review of the United Nations population fellowship programme in order to ascertain that this development had kept pace with what was required.

Interregional and regional training centres

The United Nations interregional and regional training centres administer their own fellowship programmes in response to a growing demand from the developing countries which each centre serves. These demands have increasingly reflected the regions' recognition of the importance of demography in formulating and implementing developmental policies and programmes.

Although the number of candidates from developing countries trained in these centres during each year is not a full reflection of the demand for such training, and is necessarily limited by the facilities and fellowships available during each period, a comparison of the average number of candidates trained annually during periods before and after the 1974 World Population Conference does provide some measure of the pressure on the available training facilities:

	Average number of candidates trained annually at:	
	regional centres (combined)	interregional centres (combined)
Pre-Conference	78	46
Post-Conference (up to 1980)	114	62

In January 1980 the regional centres were decentralized to the respective regional commissions, as part of an integrated approach designed to deal with regional priorities and concerns, while DTCD retained responsibility for backstopping interregional centres and programmes.

In the context of mortality and health policy, it may be noted that the centres that got an early start, that is, in the 1950s, 1960s or early 1970s, continue to provide specialized training even now in the technical and quantitative aspects of demography, where mortality as a major subject has found an important place. Over the last three to four years, however, the emphasis has shifted to a sharper focus on the interrelationships between various demographic aspects and development, in the context of an increasingly urgent quest for rapid socio-economic development, mortality and health policy are not being neglected, but rather they are being given their due priority in a training agenda that is increasingly oriented to addressing development issues.

Country Projects

During the same period, country-specific projects for institution-building and skill transfer in demography which have been implemented by DTCD afforded deeper insights into national micro-aspects of population needs and problems and in most cases have made a more concrete effort to teach specific courses in mortality and health policy, by incorporating newly emerging techniques of data collection, handling and analysis, and by collecting relevant data through special sample surveys and stimulating policies in this respect that would respond to the needs of development goals. Where infant, childhood and/or maternal mortality is still not responding to developmental stimuli, the infrastructure created through such projects and the technical capabilities developed by them have permitted the undertaking of special studies to help meet their challenge.

While playing the role of catalyst combined with technical backstopper, DTCD has tried in all of these projects to identify common denominators that may have led either to success or to pitfalls that should have been avoided, and it has tried to feed such knowledge back into the various technical co-operation projects and into the developing countries through the preparation of a number of technical documents. Others are in preparation, including one on "core courses" 13/ in demography for different levels of training, comparable to a previously produced core booklist 14/ in demography that has already been widely distributed by the Population Programme and Projects Branch (PPPB) of DTCD. The "core courses" will include a module on mortality and morbidity, as does the core booklist, which includes an extensive section on these subjects. PPPB/DTCD has also prepared a handbook 15/ of universities and institutions where academic programmes in demography are offered, with addresses and brief information on the nature of the programmes offered. However, detailed information is maintained and constantly updated in PPPB/DTCD by obtaining the latest brochures, handbooks and similar material from the relevant institutions and universities for reference in determining the most appropriate placement of United Nations fellowship trainees. Countries wishing to have their nationals trained abroad have increasingly availed themselves of this publication to select the programmes best suited for the kind of training sought. In this context, lists of institutions and universities offering specialization in different aspects of mortality, morbidity and health policy as well as in other substantive areas of demography are also available.

POPULATION AND DEVELOPMENT

DTCD implements a number of projects that provide technical assistance to developing countries to help integrate population into development plans and assist in the formulation of appropriate population policies. Implicitly such assistance is provided in all projects, of course, and especially in those that build training infrastructure and skills. In these latter projects, however, emphasis is placed on establishing a firm foundation for building development plans and population policies through studies that seek to interrelate the demographic with socio-economic and cultural variables. Mortality occupies an important place in such basic studies because of the complex linkages among infant mortality, fertility, health, morbidity, nutrition, productivity and economic well-being.

In one Latin American country, for example, a technical assistance project that aims at integrating population into development planning is concentrating the major initial effort on investigating social and anthropological factors that have perpetuated high infant and child mortality rates in some of the developing countries (and, more especially, female infant and child mortality rates). In projects of this nature, the technical assistance provided has included carefully selecting the required sample, after determining its optimum size; formulating an appropriate questionnaire, with utmost caution; and, very often, participating in the more crucial aspects of field work and advising on the required tabulations and analyses of the data so collected. In other projects where resources for such field surveys have been unavailable, as in the case of one of the West African countries, extensive library research, supplemented by data collected through individual case studies and through observation-participation projects, has been substituted to help determine the basic beliefs, customs, cultural traits and socio-economic and environmental conditions that have perpetuated high mortality and morbidity levels. Population policies for development plans that were required to be drawn up thus had a firm basis on which to formulate action programmes.

LIMITATIONS ENCOUNTERED

As mentioned above, the lack of regular mechanisms for co-ordinating the activities of the various United Nations agencies that play a major role in technical co-operation in mortality and health policy has been a very serious constant for all those agencies. Remedying this situation would thus appear to be a priority area for concerted action at this stage.

Another factor that has acted as a serious limitation on technical co-operation in those aspects of mortality and health policy which concern UN/DTCD is the recent reordering of priorities among its fields of activity by the Governing Council of the United Nations Development Programme, whereby data collection and analysis stand to be adversely affected. This is a serious setback not only to mortality and health policy but to all areas of population policy, with the notable exception of family planning. Policy can be monitored and adjusted only on the basis of measurement of response in terms of the demographic characteristics, modified through such a policy. That alone is being encouraged, as is true in the case of fertility. Assigning top priority only to family planning and activities related to it necessarily means that less attention can be given to meeting needs in other areas, and many countries have deeply felt needs in other fields. Lacking the necessary technical co-operation in these fields, Governments are obliged to make decisions, formulate policies and implement action programmes based on an inadequate knowledge of the reality and, consequently, with insufficient judgement as to what actions might be able to change the undesirable conditions.

Moreover, although the ultimate goal of technical co-operation is to promote individual and collective self-reliance, a start can only be made by transferring technology from wherever it is available. This process, which has depended, in many cases, on developing country nationals obtaining training abroad, has continued, however, to result in frequent "brain drain" despite all the precautions that have been built into the technical co-operation strategy since this intransigent problem was first recognized.

And, again, in some cases a lack or paucity of national inputs (in terms both of personnel and of physical infrastructure) to match technical co-operation inputs delayed or prevented altogether the fusing of joint effort towards institution-building for self-reliance. In extreme cases, this lack of success was a result of a lack of serious government commitment to population activities.

A combination of the limiting factors specified above and others of less importance has been responsible for technical co-operation paying less attention or none at all to encouraging developing country interest in crucial work that might otherwise be undertaken in such critical areas as rural-urban differentials in mortality and morbidity rates, and indigenous medicine and traditional practices, taboos and prejudices inhibiting modern health practices.

One of the serious gaps which technical co-operation has had to face is the current dearth of tested alternative techniques for conducting simple health surveys whose results could be reliably used in planning. It appears that the time is ripe for sponsoring world mortality surveys and world health surveys - analogous, of course, to the World Fertility Survey - not only to obtain a deeper understanding of these two fields, both of which thus far have largely been disregarded as being either of less priority or excessively complicated, but also to evolve techniques that will make the survey task simpler and the results more meaningful.

RECOMMENDATIONS

Close collaboration between the various United Nations agencies participating in technical co-operation efforts is the *sine qua non* of any further effective gains to be made in the fields of mortality and - especially - of health. On the occasion of the second international gathering in a decade to survey the state of the world's population and to take stock of events over that decade, it would be most appropriate for the partners in technical co-operation to resolve to work hand in hand and set up adequate mechanisms to translate their resolutions into action.

Many developing countries are growing to accept the overwhelming importance of maintaining vital statistics registration systems and have embarked on programmes to streamline them through technical assistance. Thanks to international co-operation, considerable progress was achieved in this area during the first half of the post-Conference decade. However, the recent reassignment of low priority to this area has set the clock back. The Expert Group would therefore do well to reaffirm the importance that must be attached to this system of continuous surveillance of, *inter alia*, death, its causes and characteristics. Similarly, experts should concentrate their attention on simple and reliable methods of conducting health surveys and analysing the data from them.

As confirmed in a joint study by the United Nations and the World Health Organization, on the one hand "very little of a reliable statistical nature is available on levels and trends in morbidity and causes of death ..." and on the other "multivariate studies of mortality help to distinguish the more important from the less important factors". Hence efforts for the collection and analysis of data must not be allowed to lag. The joint study also states that "serious constraints on health progress ... include ... shortages of administrative skills and experience and lagging international commitments to help solve the serious health problems of the region(s)". 16/ It would appear therefore that the commitment made by the international community in 1974 to the cause of alleviation of mortality and morbidity needs to be renewed and pronounced again during the forthcoming Conference, to ensure reinvestment of the required international resources in these areas.

The experience of the 1960s and the 1970s with technical co-operation efforts in the area of mortality attests to the fact that in many regions the desired declines in mortality may not depend entirely on achieving the control of diseases through medical technology. In several countries, death rates seem to indicate that the impact of socio-economic and cultural factors is outstripping current progress in medical technology. In recognition of this phenomenon, many countries have already recommended research on the interrelationships involved. However, only a beginning has been made; much more needs to be done, and done in different settings. It seems necessary, therefore, that technical co-operation in this field should be strengthened.

The fact that a low priority has now been assigned to providing funding for activities that set up mechanisms for measuring current and prospective levels, structures and differentials of mortality and morbidity in response to various actions implemented and general advances registered in socio-economic development will ultimately force planners, in the absence of firm data, to depend on subjective judgement, intuition or guesswork to evolve effective mortality policies; and this the world community cannot afford, particularly in the light of the high priority which it has assigned to achieving rapid socio-economic development. Therefore, it would be desirable for the Expert Group to recommend strongly that steps be taken to ensure that technical co-operation in the critical area of data collection, analysis and evaluation be reassigned high priority. In this context, the setting up of a world mortality survey and world health survey would seem highly desirable.

Finally, serious note should be taken of the consensus reached in 1974 in Bucharest, in the World Population Plan of Action, regarding population policies that, "while serving socio-economic objectives, they should be consistent with internationally and nationally recognized human rights ..." (para. 14(d)). Hence, technical co-operation activities that aim at integrating mortality and morbidity control into population policies should be responsive to the above consensus.

Notes and references

1/ Report of the United Nations World Population Conference, 1974, Bucharest, 19-30 August 1974 (United Nations publication, Sales No. E.75.XIII.3), chap. I.

2/ See document E/CONF.60/CBP/32.

3/ Results of the United Nations Fourth Population Inquiry among Governments, as reported in World Population Trends and Policies, 1981 Monitoring Report, vol. II: Population Policies (United Nations publication, Sales No. E.82.XIII.3), p. 23.

4/ Levels and Trends of Mortality since 1950: A Joint Study by the United Nations and the World Health Organization (United Nations publication, Sales No. E.81.XIII.3), p. 163.

5/ United Nations Fund for Population Activities, Population Programmes and Projects, vol. I: Guide to Sources of International Population Assistance 1982 (New York, 1982).

6/ United Nations Fund for Population Activities, Programme Planning and Statistics Branch, Computer List of Projects by Year of Request, by Region within Agency, as at 30 September 1982.

7/ World Population Prospects as Assessed in 1980 (United Nations publication, Sales No. E.81.XIII.8), p.10.

8/ For the report of the Symposium, see The Population Debate: Dimensions and Perspectives: Papers of the World Population Conference, Bucharest, 1974, vol. II (United Nations publication, Sales No. E/F/S.75.XIII.5), Annex IV.

9/ The average annual rate of change in life expectancy at birth in a group of 24 developing countries, which was 0.57 year during 1950-1960, fell to 0.45 year during 1960-1970. See Levels and Trends of Mortality since 1950 ..., p. 5.

10/ United Nations Fund for Population Activities, 1981 Report by the Executive Director (New York, 1982), p. 9.

11/ Statistical Office, Department of International Economic and Social Affairs, United Nations Secretariat, "Dates of national population and/or housing censuses taken during the decade 1965-1974 and taken or anticipated during the decade 1975-1984," unpublished computer listing (June 1982).

12/ The Population Programmes and Projects Branch of the Department of Technical Co-operation for Development has prepared a document that provides guidelines for handling and analysing such data in the best interests of population policy formulation for development planning: Demographic Evaluation and Analysis of Population Census Data: Aspects of Technical Co-operation (United Nations publication, Sale No. E.80.XIII.3).

13/ Population Programmes and Projects Branch, Department of Technical Co-operation for Development, United Nations Secretariat, "Course for a Basic Training Programme in Demography and Related Population Disciplines" (under preparation).

14/ Population Programmes and Projects Branch, Department of Technical Co-operation for Development, United Nations Secretariat, "Booklist for a Basic Library in Demography and Related Population Disciplines, January 1981 (mimeographed).

15/ Population Programmes and Projects Branch, Department of Technical Co-operation for Development, United Nations Secretariat, Universities and Other Institutions Teaching Demography (published by the United Nations Fund for Population Activities, 1981).

16/ Levels and Trends of Mortality since 1950 ..., pp. 111, 110 and 95-96.

B. Assistance by the United Nations Fund for Population Activities to mortality and health policy

United Nations Fund for Population Activities

INTRODUCTION

Population and development are interrelated: population factors influence development processes and are also influenced by them. The United Nations Fund for Population Activities (UNFPA) has always recognized this close association and has taken it into account, to the extent that its mandate permits, in the conduct of its activities in recipient countries.

It should be noted that there exists a considerable variation among the developing countries in the nature and severity of their population problems and their perceptions, the degree of their national commitment to population dimensions of development, and their individual capacities to mount action programmes. In line with its aims and purposes, UNFPA supports a number of activities to help increase national and regional capabilities to undertake population programmes, to promote awareness of socio-economic implications of population problems and to facilitate the formulation, implementation and evaluation of specific activities best suited to meet the individual country's needs.

For that purpose, the Fund defines its programme of assistance by major sectors including: basic data collection; population dynamics; the formulation of population policies; the implementation of general policies; family planning activities; communication and education programmes; and special programmes and multisector activities. This paper proposes to examine in depth one aspect of UNFPA's programme, i.e., its assistance in the area of mortality and health.

It should be noted that the Fund does not provide support for activities related to the reduction of mortality or improvement of health *per se*, as they are considered outside the purview of UNFPA's mandate. However, through its assistance to family planning programmes integrated with maternal and child health care, the Fund contributed indirectly to an improvement of infant, child and maternal health in developing countries. Similarly, as part of its support to the sectors of population dynamics and formulation of population policies, UNFPA extends its assistance to the collections, analysis and interpretation of mortality and morbidity data. Before an overview of the Fund's assistance to these activities is presented, it might be helpful to describe briefly some of the major issues confronting the field of mortality and health.

MAJOR ISSUES

Progress and prospects for mortality reduction

Mortality is generally considered to be a composite indicator of the various social, economic, biological and health characteristics of a society. Similarly, differences in the force of mortality across countries and among sub-populations within a country are interpreted as reflections of disparities in the level of quality of life. Furthermore, it is believed that the level of mortality in a population has important implications for the social and individual aspirations in a society and thus is expected to have a large impact on family formation attitudes and behaviour.

The last 30 years have been unique in the history of mortality trends in the world. For the developed countries, they represent an end of an era of mortality patterns which have endured for the better part of the past 100 to 200 years. The rise of life expectancy at birth to 70 or 75 years is very nearly complete in most developed countries and further progress on the mortality front is limited. Those 30 years have been equaly significant for the developing countries. Perhaps for the first time their "centuries-old" levels of high mortality have begun declining universally, although "low" levels of mortality are characteristic of only a minority of the less developed countries. The need to reduce mortality further in developing countries is considered urgent since a reduction of premature mortality is not only a health goal but also a demographic determinant of fertility transition in these countries.

Life expectancy at birth during 1980-1985 is estimated to be 72 years for developed and 57 years for developing countries 1/ and the disparity in the level of infant mortality rate between developed (16.9 infant deaths per 1,000 live births) and developing (91.5 infant deaths per 1,000 live births) countries is approximately sixfold 2/. Although average life expectancy in the developed countries reached unprecedented levels in 1980, 9 of the 39 countries responding to the United Nations Fourth Population Inquiry still considered their levels unacceptable in their prevailing economic and social circumstances. On the other hand, among the 126 developing countries responding to the Inquiry, 98 countries, or over 80 per cent, considered their level of life expectancy unacceptable even in their prevailing economic and social circumstances. It was among the contries of Africa that by far the largest proportion (49 out of 51) viewed their mortality level as unacceptable, followed by the Economic and Social Commission for Asia and the Pacific (ESCAP) area, the Economic Commission for Latin America (ECLA) area, and the Economic Commission for Western Asia (ECWA) area.3/

The World Population Plan of Action 4/ recommended in 1974 that the countries with the highest mortality levels should aim to achieve an expectation of life at birth of at least 50 years and an infant mortality rate of less than 120 per thousand live births by 1985 (para. 23). Bearing this target in mind and taking into account the fact that there has been some improvement in the average life expectancy of developing countries, there are still 40 countries - 30 in Africa and 10 in South and West Asia - where life expectancy at birth continues to be less than 50 years. While infant mortality is expected to decline from 138.5 to 116.4 in Africa during 1974-1984 and from 117.6 to 108.7 in South and West Asia during the same period, the Plan of Action's goal of 120 will remain unfulfilled in close to three dozen countries of Africa and Asia.5/

Another feature of the mortality patterns in several developing countries which calls for concern is the continuation of higher mortality of females than that of males, especially in early childhood and the reproductive span.6/ In some instances this excess mortality may be a contributory factor in the worsening of the sex ratios in national populations. Any betterment in the participation of women in education and developmental activities in association with better access to maternal and child health care would perhaps greatly reduce or even eliminate this mortality differential.

Interactions between health, mortality and development

The high mortality of developing countries is associated with, among other factors, poverty, ignorance, malnutrition, inadequate quality of housing, a lack of personal and environmental hygiene and, perhaps, low levels of immunity. Reductions in mortality and morbidity are interwoven with other processes of economic and social development. The levels and styles of socio-economic development have, for instance, implications for mortality patterns while the level and structure of mortality have influences on social and economic transformations through their effects on the quality of human resources, population productivity and patterns of investment.

Most deaths in most developing countries result from infectious and parasitic diseases. These are closely related to the prevailing social and economic conditions, and impede social and economic development. Diarrhoeal diseases are most widespread and are transmitted by human faecal contamination of soil, food and water. Similarly, diseases transmitted by insects and vectors are also rampant and have a serious adverse socio-economic impact. Furthermore, undernutrition in such countries greatly saps energy and motivation, undermining people's performance in school and at work and reducing the resistance to disease.

Recognizing the role of health in development, the World Health Organization (WHO) has formulated strategies for "Health for All by the Year 2000". 7/ Although the main emphasis of the strategies is on primary health care, it is recognized that health for all by the year 2000 cannot be achieved by the health sector alone; the co-ordinated effort of other social and economic sectors concerned with national community development (agriculture, animal husbandry, food, industry, education, housing, public works and communications, in particular) will be required.

In view of the paucity of data on mortality and health as well as the lack of trained manpower and institutional facilities in developing countries, the knowledge of interactions between mortality, health and development is not well documented. Moreover, the formulation and implementation of policies and programmes on mortality reduction have been made difficult in those countries.

Interventions to help reduce mortality and improve health status

Just as the factors that determine the extent of mortality are many and interrelated, so are the interventions that are significant in reducing mortality. The World Population Plan of Action recommended that specific interventions designed to reduce mortality and morbidity should be integrated within a comprehensive development strategy and supplemented by a wide range of mutually supporting social policy measures (para. 25). The patterns in the causes of death, wherever available, have been occasionally used to formulate specific interventions to help reduce the leading cause-specific mortality rates. The various interventions used thus far include: immunization schemes; nutritional efforts; birth spacing and their maternal and child health activities; environmental health programmes; disease prevention and control strategies; advocacy of healthier life-styles and increased availability of curative medical technology; and general social and economic development.

The mortality pattern in developing countries is characterized by an inordinately high level of infant and child mortality [which is very much related to their high level of infant and child mortality], their high level of fertility and the high incidence of avoidable and premature deaths in their populations. With the recognition of the implications of these associations for the formulation of programme strategies to deal with both high mortality and high fertility in developing countries, there is a new emphasis on these age groups in intervention programmes. The concept and practice of primary health care 8/ hold a new promise of reductions in infant and child mortality by helping to reduce case-fatality rates of diseases that are preventable by vaccination (deaths caused by diphtheria, tetanus, pertussis, measles, tuberculosis and poliomyelitis), oral rehydration therapy (death caused by diarrhoeal diseases), effective prevention and treatment of other infectious diseases (particularly deaths from acute respiratory diseases), and nutritional improvement (which helps prevent deaths from all these and many other causes).

UNFPA'S ACTIVITIES IN MORTALITY AND HEALTH

It should be pointed out that, in accordance with its mandate, UNFPA provide assistance to only a few selected aspects of activities in the area of mortality and general health. The types of activities that the Fund generally supports in the area of mortality are: data collection; research and analysis; policy formulation and planning; and awareness creation. While the Fund does not support any action programmes designed specifically to help reduce mortality, many activities that it supports in the context of integrating family planning (FP) with maternal and child health (MCH) programmes are viewed as having the additional merit of contributing to a reduction of infant, child and maternal mortality and morbidity in developing countries.

By comparison, UNFPA's involvement in health programmes is more limited. The Fund does not consider it to be within its purview to support general health programmes or basic research in MCH. At the same time, however, the thrust of the Fund's inputs in the health sector are to integrate and/or strengthen the MCH/FP component of primary health care programmes. In this context, the Fund supports family planning components and some selected MCH activities related to family planning. However, such MCH-related activities are those which directly enhance the acceptance and promotion of family planning. The types of activities that the Fund supports in the area of maternal and child health care are: pre-natal, delivery and post-natal care of mothers and the newborn; infant and child care, including drugs, medical supplies and vaccines; health education; nutrition education; fostering of breast-feeding practices; monitoring of malnutrition in infants; prophylactic supplements for mother and infants; and diagnostic studies and treatment of infertility and subfecundity. Many of the activities in the MCH/FP framework are concerned with measures and strategies that have been recommended in the Plan of Action (paras. 24 (b) and 32 (a)).

It may be emphasized that one of the main objectives of family planning programmes is the improvement of infant, child and maternal health. It may therefore be noted that the substantial assistance which the Fund provides for such activities can have an impact on the improvement of reproductive health and child survival in developing countries. The Fund's total programme or assistance during 1969-1982 amounted to $US 905 million. Of this, close to 44 per cent, or $US 393 million, was for the support of family planning activities. A rough apportionment of UNFPA assistance during the same period to MCH activities having a more direct bearing on the reduction of infant, child and maternal mortality is estimated to be $US 67.7 million. This amount represents approximately 7.5 per cent of the Fund's total programmes, or about 17.3 per cent of UNFPA total support for the family planning sector.

The data in the table below indicate that the Fund has cumulatively expended approximately $US 87.3 million for activities in the area of mortality and health policy - about $US 19.6 million for data collection, research and policy; and about $US 67.7 million for action programmes.

The quantity, quality and timeliness of mortality data are very inadequate in most developing countries, especially in sub-Saharan Africa. Although increasingly more and more countries are including indirect methods of obtaining mortality estimates from census enumerations, there is no doubt that for a proper understanding of the levels, differentials, trends and patterns of mortality it would be necessary to obtain mortality data either by improving the vital statistics registration systems and/or by conducting _ad hoc_ sample investigations. UNFPA support has taken both these forms, with special emphasis on Africa and the Middle Eastern region.

Most of the research activities supported by UNFPA have dealth with measurement of mortality; analysis of levels, trends, differentials and patterns of mortality; examination of the association of infant and child mortality with fertility; investigation of measures to help reduce mortality; development of model life tables; regional analysis of mortality patterns and consequences of declines in mortality; and production of manuals on mortality

UNFPA assistance to mortality and health policy by type of activity and programme, 1969-1982

(in $US million)

Type of programme	Type of activity		
	Data, research and policy	Action programme a/	Total
Country	14.6	59.4	74.0
Intercountry	5.0	8.3	13.3
Total	19.6	67.7	87.3

Source: Technical and Planning Division, UNFPA.

a/ The amounts shown for this activity are estimates based upon an apportionment of UNFPA support for health-related delivery systems of family planning.

and morbidity. Although the number of projects specifically dealing with policy formulation and/or the development of plans for action programmes on mortality reduction has been very small, several of the UNFPA-supported activities relating to the formulation, implementation and evaluation of population policies usually include mortality concerns.

In the area of health, the Fund has supported in addition to MCH/FP programmes some activities related to the analysis of health situations, development of manuals and handbooks and investigations of family health practices. The following presentation includes an analysis based on those projects which contain a substantial proportion of MCH activities related to infant, child and maternal mortality reduction, not on all MCH/FP projects. For a clearer understanding of the regional aspects of UNFPA's programmes in the area of mortality and health, a set of regional, interregional and global summaries are presented below.*

Regional

Sub-Saharan Africa

All the countries in the region not only are developing countries, but most of them are among the least developed of the third world. The region has been characterized by high levels of mortality, low levels of health status, deficient institutional capacities and inadequate human resource capabilities. In response to these unsatisfactory situations, UNFPA's focus of activities has been on institutional development, training and manpower expansion, and strengthening of MCH/FP service delivery. Indeed, many of the population activities in the region have implications for the improvement of health and reduction of mortality.

In view of the general paucity of mortality data in the region, the bulk of UNFPA support has been for data collection activities through censuses, vital statistics, demographic surveys and _ad hoc_ studies. Improving the national and regional capabilities to undertake research, analysis and policy formulation has been given emphasis. In addition to supporting activities designed to strengthen vital statistics registration in more than a dozen countries (Burundi, the Central African Republic, the Congo, Gabon, Kenya, Lesotho, Liberia, Sierra Leone, Swaziland, Uganda, the United Republic of Cameroon, the United Republic of Tanzania and Zaire), the Fund has supported special mortality surveys in Botswana, Nigeria, Togo and Zambia. The Economic Commission for Africa, which receives UNFPA support for its infrastructure, has provided technical backstopping to many of these activities.

Through its programme of assistance to the Economic Commission for Africa, the Fund has supported three major projects, all dealing with mortality: pilot studies to examine the relationship between infant mortality and fertility; a seminar on levels, patterns, trends and policy implications of mortality in Africa; and a number of publications** on mortality analysis in the Congo, Ethiopia, Gambia, Ghana, Kenya, Madagascar, Nigeria, Sierra Leone, Swaziland and the United Republic of Cameroon as part of a series of studies on population policy in Africa.

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*Annex I contains the list of projects included in this analysis.

** For an illustrative list of mortality and health publications resulting from UNFPA-supported projects, see annex II.

About 15 years ago, there was hardly any institutional capability in Africa to collect, analyse and process health data for policy or planning purposes. Many of the early efforts of UNFPA in the region, therefore, especifically included the establishment of demographic and health statistics systems in countries such as Burundi, the Comoros, Kenya and Madagascar.

National concern about mortality levels is nearly universal in the region. A total of 49 of the 51 countries responding to the Fourth Inquiry expressed dissatisfaction with the level of their life expectancy. Recognizing the importance of the need to lengthen life expectancy, many African countries have included specific objectives of mortality reductions in their UNFPA-supported projects on maternal and child health and family planning. The strengthening of service delivery for the care of pregnant women, lactating mothers, infants, and children up to five years of age has been crucial in many African projects. Selective primary health care strategies emphasizing a programme of immunization and nutrition coupled with an expansion of training activities for maternal and child health personnel have also been devised in several countries. Health education for a variety of health workers (nurses, midwives and medical and health attendants) has been underscored in many projects. Many of these diverse activities has been included either singly or in combination in MCH/FP projects of Botswana, the Comoros, Gambia, Kenya, Malawi, Mozambique, Niger, Nigeria, Swaziland and Zambia.

Asia and the Pacific

The region of Asia and the Pacific occupies an intermediate position among the developing regions in the level of life expectancy at birth. A majority of the countries of the region consider their levels as unacceptable, and only seven developing countries in the region are satisfied with the level of their national life expectancy. The thrust of UNFPA-supported projects in the area of mortality has been for the improvement of vital statistics registration systems, mortality measurement and analysis and selected aspects of maternal and child health care.

Although there is a long tradition of census-taking in Asia, the quality of vital statistics is extremely poor in most countries. In accordance with its policy, the Fund supports only pilot studies dealing with registration of vital events. A number of innovative approaches in vital registration, such as the sample registration scheme, model registration of causes-of-death statistics and the dual-record-keeping system, are being tested. Some of the registration activities in Afghanistan, Burma, Malaysia, Nepal, the Philippines and the Republic of Korea have been supported by the Fund.

A number of studies dealing with the levels and trends in mortality have been supported by the Fund through its assistance to ESCAP for the publication of population monographs on American Samoa, Bangladesh, India, Nepal, Papua New Guinea, the Philippines, the Republic of Korea, Sri Lanka, the Territory of Hong Kong and Thailand. Conventional mortality studies have also been conducted as a by-product of the many projects on demographic training and research in Indonesia, Malaysia, the Philippines and Sri Lanka, for instance.

The interrelationship between infant and child mortality and fertility has been a topic of research for many UNFPA-supported projects in the region. In addition to a number of micro simulation studies conducted at the International Institute of Population Studies, some field investigations have also been supported, as in Mongolia and the Bohol project in the Philippines. Furthermore, UNFPA has funded both regional and country projects which have as a major objective the provision of technical assistance to activities related to mortality and morbidity. Through its regional support to ESCAP, the Fund has assisted in the publication of a comparative analysis of mortality trends and patterns in selected countries of Asia and the Pacific.

The concern with policy aspects of mortality and health is evident in a number of projects dealing with policy formulation and implementation of policies other than family planning. Several studies dealing with the relationship between family health and size of the family have been supported in this context. Many of the MCH/FP projects have generated data on morbidity patterns and reproductive health (Bangladesh, India, Malaysia, Nepal, the Philippines and Sri Lanka). In some countries, they have been instrumental in establishing perinatal information systems. At present the Fund is supporting a very complex project in Mongolia on epidemiological studies of population growth. It includes a detailed investigation of levels and differentials in maternal and infant and child mortality in the various provinces of Mongolia with a view to developing action programmes to help reduce perinatal and maternal mortality. As part of this comprehensive programme, the project expects to conduct research on MCH activities, nutritional interventions and related aspects. The Fund has also supported impact analysis of models used for mortality reduction in China and Mongolia.

A large portion of UNFPA-supported projects in the region deal with the strengthening of integrated MCH/FP in the context of primary health care. Within this framework a few countries, such as Afghanistan, Bangladesh, Nepal and Pakistan, where infant and child mortality rates are high, have included activities for prevention of maternal morbidity and mortality by early detection of high-risk pregnancy, recognition of abnormal condition in the post-partum period and health education. Prevention of child mortality and morbidity through the early detection of serious illness and childhood malnutrition and through general health education has been supported in Afghanistan, Bangladesh, Bhutan, China, Mongolia, Pakistan and Thailand. The role of immunization in improving maternal and child health is well recognized in many MCH/FP projects in the region. In Afghanistan, for instance, the Fund has supported a programme of immunization and prophylaxis against anaemia in mothers and children. The Fund is also aware of the important role that detection, diagnosis and treatment of infertility plays in the improvement of reproductive health and has supported facilities for such programmes in Afghanistan and Mongolia.

Latin America and the Caribbean

The average life expectancy at birth for this region is approximately 64 years - a substantially higher figure than those for Asian, African and the Middle Eastern regions. And yet in the Fourth Inquiry close to 60 per cent of the countries expressed their concern regarding their respective levels of mortality. The quality of vital statistics produced by the registration systems in Latin America is still inadequate and the Fund has supported strengthening of vital registration in Honduras, Nicaragua, Panama, Peru and Uruguay. The lack of appropriate vital statistics has also engendered utilization of indirect methods of mortality estimation. A number of such analyses have been undertaken for several Latin American countries, including Bolivia, Chile, Colombia, Costa Rica, the Dominican Republic, El Salvador, Ecuador, Guatemala, Honduras, Nicaragua and Paraguay. In addition, a number of field investigations of infant mortality have been undertaken with UNFPA support in Colombia, Cuba, Panama and Peru.

Relatively speaking, a large number of health-related studies have been financed by UNFPA in Latin America. Through the regional programme extensive analysis have been attempted to devise population and health strategies in the region. A comprehensive project has addressed the issues involved in the integration of population, nutrition and health activities with development planning. Similarly, a number of investigations of health manpower requirements have been financed. There are not many projects exclusively dealing with activities designed to influence policies and programmes on mortality reduction. As in other regions, a few of the projects on integrated MCH/FP projects in Latin America also contain some activities related to reductions of maternal and child mortality. Examples in this category are Cuba, Panama, Paraguay and Peru. While the emphasis in the Peruvian project is on training of medical and health professionals, a system of early detection for high-risk pregnancies and births is used as strategy towards reduction of infant and child mortality in Panama and Cuba. In Paraguay, a selective primary health care strategy focusing on a programme of immunization, nutritional supplements and oral rehydration therapy has been employed.

Middle East and Mediterranean

As in other developing regions, the knowledge of mortality incidence in the Middle East and Mediterranean region is also inadequate. The quality of vital statistics generated through civil registration schemes is very poor and the prospects for collecting direct information on mortality through censuses or sample investigations are slim given the numerous methodological difficulties in collecting such data. Information on health conditions is even more limited. Monitoring of reproductive health, maternal morbidity and infant and child health is made impossible in the absence of a health statistical system.

In response to these situations, UNFPA programmes have concentrated on strengthening demographic and vital statistics collection systems, on ad hoc sample investigation of mortality and morbidity, on research on the identification of "high-risk" groups of population and on the interrelationships between population, health and development. Although limited in the extent of its involvement, the Fund has assisted in the improvement of vital statistics registration systems in Cyprus, Democratic Yemen, Iraq, Jordan, Lebanon, the Sudan, Somalia, the Syrian Arab Republic and

Yemen. In addition to these, UNFPA has expended funds to help conduct field investigations on levels, trends, differentials and correlates of infant mortality in Egypt and in Damascus City in the Syrian Arab Republic. In both cases, the findings of the surveys were useful in identifying measures to help reduce mortality.

Monitoring of maternal mortality through a health information system is only slowly beginning to attract attention in the region. A number of consultancy missions were recently undertaken in a number of countries, including Afghanistan, Egypt, Jordan, Kuwait, the Lybian Arab Jamahiriya, Pakistan, the Sudan, the Syrian Arab Republic and Tunisia. As is the case with other regions, some of the MCH/FP projects in the Middle East and Mediterranean region also deal with selected aspects of maternal and child health. The number of such projects with concentration on mortality objectives has been small.

Europe

As a region, Europe continues to enjoy a high level of life expectancy at birth. While there is relatively less concern with efforts to reduce premature mortality in view of its low incidence, a number of countries are eager to reduce mortality differentials by sex, region and socio-economic and occupational statuses. However, there has been a growing interest in studying the interrelationships between life-styles and patterns in causes of death with a view to developing health education strategies. The Fund has supported the training of health professionals from developing countries by providing assistance to training programmes in some Eastern European countries. For instance, the Fund collaborated with WHO and the Government of Czechoslovakia in organizing a seminar on primary health care including family planning for health professionals from developing countries. Similarly, during 1983 with support from UNFPA the Government of Romania is organizing an international seminar to discuss the concept and method of using the "risk" approach for reducing infant mortality and morbidity in poorer countries.

Interregional and Global

UNFPA supported about 40 major projects on mortality research during 1969-1982, with a cumulative expenditure of approximately $5 million. Most of these efforts have been undertaken with the United Nations, WHO, the International Union for the Scientific Study of Population (IUSSP), the Committee for International Co-ordination of National Research on Demography (CICRED), and other institutions. Much of the work at the interregional level relates to conceptual and methodological development; review, appraisal and monitoring; comparative studies; manual preparation and designing of guidelines; training, awareness creation and information exchange; and publication and dissemination of reports.

Training and Awareness Creation

International workshops and seminars are extremely important in conveying the urgency of co-ordinated actions at national and international levels on the improvement of health and lengthening of life expectancy in both developed and developing countries. Moreover, they function as training opportunities for demographers and health professionals of developing countries. UNFPA either has been associated with or has co-sponsored many important meetings, such as the Mexico Meeting on Socio-economic Determinants and Consequences of Mortality; the Health Congress on Maternal and Neo-natal Health; the International Conference on National Committees on Vital and Health Statistics; and the International Symposium on Women and Their Health. In addition, the many seminars organized by CICRED with UNFPA support facilitate a general improvement in the quality of co-operative research studies.

Many activities at the interregional level have led to the publication of the most important studies on mortality, including: Levels and Trends of Mortality since 1950; Model Life Tables for Developing Countries; and the Proceedings of the Meeting on Socio-economic Determinants and Consequences of Mortality.

FUTURE NEEDS IN THE AREA OF MORTALITY AND HEALTH

While there have been considerable achievements in the lengthening of life expectancy in developing countries during the past three decades, there is a growing concern about their recent mortality trends. The levelling off of life expectancies in the less developed countries appears to have occurred both sooner and at lower levels than had been expected. In addition, a large number of countries in South Asia and sub-Saharan Africa continue to experience high levels of infant, child and adult mortality.

Research and Analysis

The Fund is currently providing assistance to WHO and the United Nations for a comprehensive collaborative project which seeks to measure mortality trends and to examine in depth the roles of socio-economic development as well as specific health and related interventions in mortality decline in selected developing countries. The case studies have been so chosen as to capture the regional differences between Asia, Africa and Latin America (Bangladesh, Sri Lanka; Kenya, Senegal; Guatemala). Results of these studies should help identify the policies and programmes needed to achieve mortality reduction.

The World Population Plan of Action singled out the reduction of infant and child mortality as one of the programme areas with the highest priority for developing countries. It has long been clear that the development of proper strategies would require a field investigation of the demographic, biological, health and environmental factors responsible for infant and child health. The Fund has provided assistance through WHO for the conduct of such field investigations in a number of countries, including Afghanistan, Algeria, the Sudan and Trinidad and Tobago. The findings of these studies have been varied with regard to the relationship of infant and child mortality with fertility. Nevertheless, surveys have produced a wealth of information on fertility, health and mortality among children and mothers as well as data on the utilization patterns of health care facilities. Many of the strategies that are currently in operation in these countries have been based on these studies.

The investigation of relationships between demographic processes and health has also been a major focus of UNFPA-supported projects at the interregional level. A detailed study of health aspects of fertility based on data from the World Fertility Survey has looked into many important aspects such as lactation amenorrhea, birth intervals, subfecundity, foetal wastage and mortality. Other activities in the health area include operations research on health delivery systems, formulation of health manpower plans, manuals on and monitoring of health education and health statistics methodologies.

It would seem clear that any future agenda in the area of mortality research should include, among other priorities, the persistence of high mortality in the least developed countries, the early levelling off of life expectancies in many developing countries and the determinants of socio-economic and other differentials in mortality of developed countries; and all those call for new data and analysis as well as modified approaches in the formulation of policies and programmes to deal with them.

Data Analysis

An understanding of the mortality situation in many developing countries has been hampered by the absence of adequate data on mortality patterns especially by causes of death; that would indicate the need for epidemiological-demographic investigations of mortality and morbidity. In view of the growing concern about mortality differentials in both developed and developing countries, it would be desirable to have descriptive data on mortality by socio-economic, regional and occupational statuses. While direct information on these aspects is likely to be collected in developed countries, the situation is quite different in developing countries. Owing to the difficulties surrounding the collection of direct information on differentials and patterns of mortality, developing countries have to depend on indirect methods of mortality estimations based on censuses and *ad hoc* sample investigations.

A number of analytical and methodological developments are also required for a better understanding of the many dimensions of mortality. Especially important in this category is policy analysis of mortality and morbidity as well as impact studies of specific health and other interventions. In view of the persistence of high infant, child and adult mortality and the continued slow progress in development efforts of most developing countries, studies on the cost-effectiveness of different interventions are urgently needed. Another important area in this context is the examination of the relationship between types of feeding practices and infant and child mortality and fertility.

Policy and Programmes

While the debate continues on the relative contributions of socio-economic development and health interventions to the reduction of mortality in developing countries, there is a growing recognition that health and nutrition programmes should be integrated within a comprehensive development strategy and that special attention should be given to population living in remote rural areas and to the underprivileged groups. There is an increasing trend in the developing countries to give new impetus to the primary health care approach. Although only a limited number of studies on the effectiveness of primary health care in reducing mortality in developing countries has been undertaken, a study analysing pilot projects in Guatemala, India, the Islamic Republic of Iran, Jamaica, Nigeria, Peru and Turkey suggests that efficiently administered nutrition and primary health care programmes can reduce infant and child mortality rates by one third to one half within one to five years.9/

Yet another strategy with significant potential for its adaptation in the developing countries is the selective primary health care designed for priority disease control. 10/ It places the highest priority on child vaccination against measles and diphtheria-pertussis-tetanus (DPT); tetanus toxoid for all women of reproductive ages; health education for breast-feeding; wide dissemination of chloroquinine for malaria fever; and a programme for instruction regarding the distribution of oral rehydration packets. Many demographic investigations in developing countries repeatedly point to the important role of education of women and fostering of income and social redistributive strategies in mortality reduction. The experiences of China, Cuba, Kerala in India, and Sri Lanka are cases in point.

While all those strategies are potentially effective in mortality reduction and are not very difficult to formulate, the real challenge lies in their implementation. The prospects for success in implementing the strategies not only are dampened by the pervasive poverty in the third world, but also are closely associated with political, managerial and cultural factors unique to each developing country. While erradication of poverty is fundamental, the vigorous implementation of some of these strategies should lead to a sizeable reduction in premature loss of life and the attendant human agony in developing countries.

Notes and references

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3/ World Population Trends and Policies, 1981 Monitoring Report, vol. II: Population Policies (United Nations publication, Sales No. E.82.XIII.3).

4/ Report of the United Nations World Population Conference, 1974, Bucharest, 19-30 August 1974 (United Nations publication, Sales No. E.75.XIII.3), chap. I.

5/ As judged by the estimates of infant mortality rate during 1980-1985.

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10/ J. A. Walsh and K. S. Warren, "Selective primary health care: an interim strategy for disease control in developing countries," The New England Journal of Medicine, vol. 301, (November 1979), pp. 967-974.

ANNEX I

UNFPA Assistance to Projects in Mortality and Health a/

Region major activity		Project title	Status
Africa			
Vital Statistics Registration			
BDI-78-P02	Burundi	Improvement Civil Registration and Vital Statistics System	Ongoing
CAF-78-P01	Central Africa Rep.	Civil Registration	Completed
CMR-79-P01	Cameroon	Civil Registration	Completed
GAB-73-P01	Gambia	Observation Permanente des Faits Démographiques	Completed
GHA/72/P04	Ghana	Expansion of National Compulsory Registration System for Births and Deaths and Development of Vital Statistics	Completed
KEN-72-P04	Kenya	Establishment of an Information System for Vital and Health Statistics	Completed
KEN-79-P04	Kenya	Strengthening of Vital Statistics and Civil Registration System	Ongoing
LES-74-P05	Lesotho	Plotting and Registration of Births and Deaths	Completed
LIR-75-P01	Liberia	Demographic Survey	Completed

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a/ The list includes only those projects that deal either totally or to a substantial extent with mortality or MCH-related activities. The list, however, does not include all UNFPA-supported MCH/FP projects.

Africa - con't.

Vital Statistics Registration

PRC-76-P03	Congo (P. R.)	Improvement of Civil Registration System	**Completed**
SIL-71-P02	Sierra Leone	Vital Statistics Registration System	**Completed**
SIL-79-P03	Sierra Leone	Strengthening of Civil Registration System	**Ongoing**
SWA-72-P01	Swaziland	Improving Demographic and Vital Statistics	**Completed**
SWA-78-P03	Swaziland	Swaziland Civil Registration	**Ongoing**
UGA-76-P02	Uganda	Establishment of a Comprehensive Vital Statistics and Civil Registration System	**Completed**
URT-79-P05	Tanzania	Reorganization and Expansion of Compulsory Civil Registration System in Tanzania	**Completed**
ZAI-72-P01	Zaire	Reorganization of the Civil Registration System	**Completed**
RAF-79-P07	Regional	Seminar on Civil Registration, OCAM	**Completed**
RAF-79-P24	Regional	Working Group on Civil Registration Systems and Vital Statistics Collection in Africa	**Completed**

Data and Analysis

BDI-72-P01	Burundi	Health Statistics	**Completed**
BOT-78-P02	Botswana	Survey of Mortality and Fertility Patterns	**Ongoing**
COI-79-P01	Comoro Isl.	Strengthening of the Demographic and Health Statistics System	**Completed**
GUI-72-P01	Guinea	Development of Basic Health Statistics	**Completed**

Africa - con't.

Data and Analysis

KEN-72-P04	Kenya	Establishment of an Information System for Vital and Health Statistics	Completed
MAG-79-P02	Madagascar	Strengthening of Demographic and Health Statistics System	Ongoing
NIR-70-P03	Nigeria	Sociology/Demography Inst. of Child Health	Completed
TOG-78-P01	Togo	Survey on Infant Mortality (IFORD)	Ongoing
ZAM-80-P01	Zambia	Analysis of Mortality/Fertility Survey Data	Ongoing
RAF-78-P17	Regional	Expert Group Meeting on Mortality Levels, Patterns and Trends in Africa and their Policy Implications, and Work Group Fertility	Completed

Action Programmes and Awareness Creation

BOT-75-P01	Botswana	Assistance to National FP Programme	Ongoing
COI-79-P03	Comoro Isl.	Development of Maternal and Child Health/Family Planning Services	Ongoing
GAM-79-P01	Gambia	Improvement of MCH and Family Welfare Services in Rural Areas	Ongoing
KEN-74-P04 P05, P06	Kenya	Assistance to the Kenyan Family Planning Programme	Ongoing
LES-74-P03	Lesotho	Expansion and Upgrading of Rural Health Clinics	Ongoing
MLW-78-P03	Malawi	Development of a Comprehensive Maternal and Child Health Programme	Completed
MOZ-78-P01	Mozambique	Development of National FP Programme	Ongoing
NER-77-P01	Niger	Development of MCH/FP Service	Ongoing
NIR-79-P01	Nigeria	Establishment of a Family Health Co-ordinating Unit Responsible for MCH/FP	Ongoing

Africa - Con't.

Action Programmes and Awareness Creation

SEN-79-P02	Senegal	Pilot Project on Educ. in an Urban Environment in Health, Nutrition and Population	Ongoing
SWA-71-P02	Swaziland	Public Health Centres	Completed
SWA-75-P01	Swaziland	Assistance to National FP Programme	Ongoing
URT-79-P08	Tanzania	Workshops for Primary Health Care Workers	Ongoing
ZAM-74-P02	Zambia	Assistance to Family Health Programme	
RAF-70-P08	Regional Project	Technical Meeting on Pilot Studies on Fertility, Infant Mortality and Evaluation of Population Programmes	Completed
RAF-73-P21	Regional Project	An Africa Medical Students Workshop on Population Problems and Community Health Care	Completed

Asia

Vital Statistics Registration

AFG-74-P02	Afghanistan	Population Registration	Completed
AFG-75-P01	Afghanistan	Population Registration Review Mission	Completed
AFG-77-P01	Afghanistan	Civil Registration	Ongoing
AFG-78-P01	Afghanistan	Communication for Civil Registration	Ongoing
BUR-75-P02	Burma	Vital Statistics and Registration	Ongoing
MAL-79-P07	Malaysia	Strengthening National Registration Dept.	Completed
NEP-72-P01	Nepal	Demographic Statistics	Completed
NEP-74-P05	Nepal	Civil and Vital Registration	Completed
NEP-80-P02	Nepal	Expansion of Vital Events Registration System	Ongoing

Asia - con't.

Vital Statistics Registration

PHI-80-P02	Philippines	Strengthening of the Census and Vital Registration	Ongoing
ROK-77-P08	Korea	Vital Statistics Improvement	Completed
RAS-76-P24	Regional	ESCAP Regional Programme for Vital Statistics	Completed

Data and Analysis

AFG-77-P01	Afghanistan	Pilot Activities in Vital Registration	Ongoing
INS-79-P16	Indonesia	Demographic Training and Resch. at the Gadjah Mada University	Ongoing
INS-71-P05	Indonesia	Libraries for Health Personnel	Completed
INS-79-P14	Indonesia	Development of Resch. and Expansion of Training Courses at the Demographic Inst.	Ongoing
INS-79-P16	Indonesia	Demographic Training and Research at Gadjah Mada University	Ongoing
MAL-79-P11	Malaysia	Resch. for the Development of Perinatal Services, co-ordinated by the National University of Malaysia	Ongoing
MON-79-P02	Mongolia	Epidemiological Studies of Population Growth and in Developing MCH Services	Ongoing
NEP-80-P02	Nepal	Improvement of Vital Registration	Ongoing
SRL-71-P02	Sri Lanka	Studies of Activities of Public Health Personnel	Ongoing
THA-78-P18	Thailand	Health Development and Population Growth in Rural Thailand	Completed
RAS-70-P15	Regional	Comparative Study of Mortality Trends in ESCAFE Countries and Asian Model Life Tables	Completed

Asia - con't.

Action Programmes and Awareness Creation

AFG-76-P01	Afghanistan	Integration of Family Planning Services into the Basic Maternal Health Delivery System	Ongoing
BDG-79-P04	Bangladesh	Support to Integrated MCH/FP Services and to the Pop. Control and FP	Ongoing
BHU-79-P01	Bhutan	Development and Strengthening of MCH and FP Services	Ongoing
CPR-80-P06	China	Expansion of Services and Research for Maternal and Perinatal Care	Ongoing
IND-78-P05	India	Mortality Reduction Measures (Immunization)	Completed
INS-71-P03	Indonesia	Course on the Health Aspects of Human Reproduction	Completed
NEP-80-P13	Nepal	Assistance to FP/MCH Project	Ongoing
PAK-82-P08	Pakistan	Strengthening of Community Based Family Planning via MCH Services Delivery through Family Welfare Centres	Ongoing
PNG-73-P01	Papua New Guinea	Assistance for the Development of Delivery Services for Maternal Child Health/Family Planning Programmes	Ongoing
ROK-77-P02	Rep.of Korea	Institutional Support for Staff Development Programme at Korea Inst. for Population and Health	Ongoing
SRL-81-P09	Sri Lanka	MCH/FP for Estate Workers	Ongoing
THA-78-P12	Thailand	Training and Follow-up Support of Peripheral and Primary Health Care Workers	Ongoing
RAS-71-P08	Regional	Regional Course on Health Aspects Population Dynamics	Completed
RAS-76-P08	Regional	Sub-Regional Training Course on the Analysis of Fertility and Mortality Data	Completed

Europe

Data and Analysis

BUL-79-P01	Bulgaria	Research into the Causes of and Remedies for Sterility, Phase I	Ongoing
BUL-79-P03	Bulgaria	Evaluation of Demographic Data Related to the Health of the Working Population	Completed
BUL-82-P01	Bulgaria	Research into the Causes of and Remedies for Sterility, Phase II	Ongoing
HUN-81-P01	Hungary	Studies of Mortality Differentials	Ongoing
YUG-75-P04	Yugoslavia	Comparative Study of Fert., Mortality + Soc.-Eco. Conditions	Ongoing

Action Programmes and Awareness Creation

CZE-79-P02	Czechoslovakia	Seminar on Primary Health Care for Children for Participants from Developing Countries	
ROM-83-P01	Romania	International Seminar on Infant Risk	Ongoing

Latin America

Vital Statistics Registration

HON-72-P01	Honduras	Vital Statistics and Civil Registration	Completed
HON-78-P02	Honduras	Assistance in Civil Registration and Vital Statistics	Completed
NIC-71-P01	Nicaragua	Establishment of a National System of Civil Registration and Vital Statistics	Completed
PAN-73-P03	Panama	Civil Registration and Vital Statistics	Completed
PER-79-P04	Peru	Civil Registration and Vital Statistics System Reorganization	Completed

Latin America - con't.

Vital Statistics Registration

URU-75-P01	Uruguay	Civil Registration and Vital Statistics	Completed
RLA-71-P09	Regional	Committee of Experts in Promotion of Improvement of Vital Statistics	Completed
RLA-78-P14	Regional	Improvement of Vital Statistics and Civil Registration System	Ongoing

Data and Analysis

URU-78-P01	Uruguay	Studies on Maternal and Infant Morbidity and Mortality	Ongoing
TRI-72-P01	Trinidad and Tobago	Health and Population Dynamics	Completed
RLA-76-P18	Regional	Determination of Needs in Health Manpower Development	Completed

Action Programmes and Awareness Creation

CUB-73-P01	Cuba	Extension of Maternal and Child Health Services and Activities Related to Pop. Dynamics	Completed
CUB-79-P04	Cuba	Maternal and Child Health and FP Services	Ongoing
ECU-77-P01	Ecuador	Re-Equipment of Health Clinics in Earthquake Affected Areas	Completed
ECU-77-P03	Ecuador	Rural Health Services	Completed
ELS-77-P02	El Salvador	Establishment of Rural MCH/FP Training Centres	Ongoing
PAN-78-P02	Panama	Extension of MCH/FP Programme	Ongoing
PAR-82-P02	Paraguay	Extension of MCH Programme to Rural Areas	Ongoing
PER-79-P03	Peru	Expansion of MCH/FP Services	Ongoing
RLA-72-P26	Regional	Health Education	Completed

Latin America - con't.

Action Programmes and Awareness Creation

RLA-74-P06	Regional	Amro - Health and Population Dynamics	Completed
RLA-78-P03	Regional	Strengthening of Integrated Primary Health Services and Assistance with Project Formulation	Completed
RLA-78-P26	Regional	Population and Nutrition Integration in Food and Nutrition Planning/Health Programmes in Developing Countries	Completed

Middle East and Mediterranean

Vital Statistics Registration

CYP-72-P03	Cyprus	Improvement of Civil Registration and Vital Statistics	Completed
IRQ-72-P01	Iraq	Improvement of Civil Registration Collection of Vital Statistics by Sampling Methods	Completed
JOR-72-P01	Jordan	National Registration and Vital Statistics	Completed
PDY-74-P01	Yemen (P. D.)	Civil Registration	Ongoing
SAU-72-P02	Saudi Arabia	Improvement of Civil Registration	Completed
SOM-80-P03	Somalia	Improvement of Civil Registration and Vital Statistics System - Phase I	Completed
SUD-74-P01	Sudan	Registration of Births and Deaths	Completed
SYR-76-P06	Syria	Assistance for Development of Civil Registration	Completed
YEM-76-P01	Yemen	Civil Registration and Vital Statistics	Completed

Middle East and Mediterranean - con't.

Data and Analysis

EGY-70-P01	Egypt	Measurement of Population Change at the Centre for Health Statistics	Completed
EGY-77-P01	Egypt	Foetal and Infant Mortality Sample Survey	Ongoing
LEB-70-P01	Lebanon	Vital Health Statistics	Completed

Action Programmes and Creation Awareness

SRY-72-P02	Syrian A. R.	Infant Mortality Survey in Damascus City	Completed
EGY-79-P04	Egypt	Workshop on Child Health in Egypt	Completed
TUR-76-P04	Turkey	Re-equipment of Health Clinics in Earthquake Affected Areas	Completed
RME-70-P03	Regional	Integration of Family Planning Activities into Health Services: Training and Institutional Support for FP, Organization, Management and Evaluation	Ongoing
RMI-72-P13	Regional	Expert Group Meeting on Mortality and Proposed Regional Population Council	Completed
RMI-79-P13	Regional	Intercountry (ECA) Interregional (WHO)	Completed

Interregional Programmes

Vital Statistics Registration

INT-70-P11	Interregional	Registration of Pregnancies	Completed
INT-73-P38	Interregional	Second International Conf. of Nat'l Committees on Vital and Health Statistics	Completed
INT-73-P44	Interregional	Population and Vital Statistics Report	Completed

Interregional Programmes - con't.

Data and Analysis

INT-70-P07	Interregional	Study Group on Health Statistics and Human Reproduction	Completed
INT-70-P09	Interregional	Study of Levels, Trends, and Differentials in Foetal, Infant and Early Childhood Mortality	Completed
INT-70-P10	Interregional	Ad Hoc Survey on Foetal Infant and Early Childhood Mortality and Fertility Patterns	Completed
INT-71-P27	Interregional	Methodology of Reporting and Analysis of Prenatal and Maternal Morbidity and Mortality	Completed
INT-71-P29	Interregional	Consultations on Projections of Health Statistical Trends	Completed
INT-72-P09	Interregional	Investigation into Urban/Rural Differentials of Mortality	Completed
INT-72-P12	Interregional	Health Manpower Statistics	Completed
INT-72-P17	Interregional	Operations Research on Health Serv. Dev.	Completed
INT-73-P40	Interregional	Resch. on Interrelationships betw. Health, Pop. and Soc-Eco.Development	Completed
INT-79-P37	Interregional	Multinational Study of Women as Providers of Health Care: Changing Perspectives	Ongoing
INT-79-P49	Interregional	Attitudes of Adolescents towards Reproduction: On Contraceptive Choice, Outcome of Pregnancy, etc.	Ongoing
INT-80-P07	Interregional	Monitoring of Trends and Differentials of Maternal and Child Health	Ongoing
INT-80-P09	Interregional	Joint Study with WHO on Trends, Causes and Potential Consequences of Mortality Among Developing Countries	Ongoing
INT-82-P18	Interregional	Joint Study with WHO on Trends Causes and Potential Consequences of Mortality among Dev.Countries: Bangladesh, Guatemala, Kenya, Senegal and Sri Lanka	Ongoing

Interregional Programmes - con't.

Data and Analysis

INT-70-P15	Interregional	Review and Appraisal of Health Educ. in Health Context	Completed
INT-70-P20	Interregional	Manual on Morbidity and Mortality Analysis	Completed
INT-74-P08	Interregional	Health Demographic and Statistical System	Completed
INT-79-P42	Interregional	Research on Health Education and Community Participation	Ongoing
INT-79-P52	Interregional	Analysis of World Fertility Survey: Health Aspects	Completed
INT-76-P14	Interregional	International Union for the Scientific Study of Population	Ongoing

Action Programmes and Creation Awareness

INT-70-P35	Interregional	Workshop for Training National Health Statisticians	Completed
INT-72-P18	Interregional	Interregional Seminar on Mortality Analysis	Completed
INT-73-P09	Interregional	Employers' Occupational Health and Welfare and Pop. Nat'l Seminars for Employers	Completed
INT-73-P38	Interregional	Second International Conf. of Nat'l Committees on Vital and Health Stat.	Completed
INT-74-P11	Interregional	Training of Health Service Personnel	Completed
INT-77-P13	Interregional	International Assoc. for Maternal and Neo-natal Health 1981 Congress	Ongoing
INT-71-P19	Interregional	Health Education Materials-Communication Media	Completed
INT-80-P05	Interregional	Symposium on Women and their Health	Completed
INT-82-P21	Interregional	Support to Muslim Scholars Congress on Population, Health and Development	Ongoing

Global Programmes

Vital Statistics Registration

GLO-78-P20	Global	Improvement of Civil Registration	Ongoing

Data and Analysis

GLO-77-P25	Global	Mortality Data for Developing Countries	Completed

Action Programmes and Creation Awareness

GLO-82-P15	Global	Scientific Meeting - International Assoc. for Maternal and Neo-natal Health	Ongoing
GLO-74-P22	Global	CICRED Seminar on Infant Mortality	Completed
GLO-78-P19	Global	Meeting on Socio-Economic Determinants and Consequences of Mortality	Completed
GLO-79-P71	Global	Centre for Development and Population Activities for a Book of Profiles on Women Managers in Population, Health and Development Programmes	Ongoing

ANNEX II

Selected Publications on Mortality and Health from UNFPA-Supported Projects

Project No.	Title of Publication
AFRICA	
SIL-77-P02	*Basic Health Information Retrieval in Sierra Leone.*
SIL-78-P02	*Mortality Levels and Differentials in Sierra Leone. Census Analysis Vol.2.*
NIR-74-P01	*Exploratory Study of Maternal and Child Health Knowledge, Beliefs and Practices, Ikot Omin, Nigeria.*
NIR-74-P03	*Morbidity-Mortality in an Urban Setting: The case of Lagos.*
MLW-78-P03	*Overview of Health Education Activities and Proposals for Strengthening of Health Education Services in Malawi.*
RAF-78-P04	*Several reports dealing with population policy in* - Congo, Ethiopia, Gambia, Ghana, Kenya, Sierra Leone, Madagascar, Nigeria, Swaziland and United Republic of Cameroon.
RAF-78-P10	*Séminaire inter-îles de l'Océan Indien.*
RAF-78-P17	*Proceedings of the Expert Group Meeting on Fertility and Mortality Levels in Africa and their Policy Implications.* Monrovia, Liberia, 26 November to 1 December 1981.
ASIA AND THE PACIFIC	
PHI-73-P11	*Quality of Service Statistics in the Bohol Project:* a study of the twenty primary health care centers with the least consistent reports;
	Trends in Child Malnutrition in the Bohol Project Area: 1976-1979;
	Maternal and Child Health Practices of Women in Bohol by Socio-economic and Demographic Characteristics: 1976 vs. 1978;
	Relationship Between Infant and Child Mortality and Fertility in Bohol;

	Reported Causes of Deaths by Age: Bohol Project and Non-project Areas, 1970-75 and 1976-79;
	Trends in Sterility, Infant Mortality and Pregnancy Wastage in Bohol Project Areas, 1976-78.
	Trends in Morbidity in Bohol: 1976 and 1978.
PHI-79-P04	*On the Road to Longevity*: 1970 National and Provincial Mortality Estimates for the Philippines.
MAL-79-P01	*Primary Health Care for Urban Squatter Settlements* (a Malaysian experience).
BDG-76-P03	*Vulnerable Group Feeding*.
PNG-74-P01	*Study of Fertility and Mortality Among the Indigenous* Population of Papua New Guinea.

LATIN AMERICA

CUB-79-P02	*La Mortalidad Infantil Según Variables Socioeconómicas y Geográficas*, 1974.
CAY-77-P01	*Cayman Islands Genetic Disease Prevention Programme*.
BOL-79-P01	*Bolivia: La Mortalidad y la Fecundidad en el Período 1950-1976.*
ECU-74-P01	*Estudio de Evaluación de las Colaboradoras Voluntarias Rurales (C.V.R.) Adiestradas en el Programa de Salud Materno Infantil y Bienestar Familiar*.
ECU-77-P033	*Conocimientos, Actitudes y Prácticas de Salud en el Area Rural*.
CHI-73-P01	*Programa de Extensión de Servicios Materno Infantiles y de Bienestar Familiar (PESMIM) 1973-1976*.
CHI-73-P02	*Programa Rural de Atención Materno Infantil (PRUMIN)*.
COL-73-P03	*Evaluación del Programa Materno Infantil de Colombia, Enero 1974 - Mayo 1976*.
RLA-78-P24	*Aspectos Socio-demográficos Relevantes en el Estudio de la Mortalidad Infantil y su Asociación con la Fecundidad en Colombia*; *Determinantes de la Mortalidad Infantil en Panamá* (1940-1974); y *Mortalidad Infantil y Atención Materno Infantil en el Perú*.

RLA-78-P26	Population and Nutrition: Their Integration in Development Planning in Health Programmes in Latin America.

EUROPE

HUN-79-P02	Estimation of Mortality Levels from Incomplete Data.
INT-74-P13	Proceedings of the Meeting on Socioeconomic Determinants and Consequences of Mortality. El Colegio de México, 19-25 June 1979.
INT-74-P16	Workshop on Risk Approach in Maternal and Child Care, Nottingham, April 14-15 1980.
INT-75-P08	Relationships between Fertility, Child Mortality and Nutrition in Africa.
INT-76-P14	Design Problems and Data Collection Strategies in Studies of Mortality Differentials; Comparison between Prospective and Retrospective Demographic Surveys to Estimate Levels and Differentials of Mortality; The Demographic Surveillance System, Matlab, Dacca, Bangladesh; Methods for Identifying Mortality Risk Factors in Longitudinal Studies; Analyse Multidimentionnelle de la Mortalité; Estimating the Covariates of Childhood Mortality from Retrospective Reports of Mothers; Evaluation of Indirect Methods for Estimating Mortality; Construction of a New United Nations Model Life Tables System; Age, Period and Cohort Analysis Effects in Mortality Studies; Heterogeneity and its Effect on Mortality Measurement.
INT-76-P08	Childhood Mortality Estimates from Non-random Data.
INT-77-P12	Towards a Better Future: Maternal and Child Health.

INT-79-P56	Contemporary Patterns of Breast-feeding.
INT-80-P09	Infant and Early Childhood Mortality in Sierra Leone, Afghanistan, Sudan and Algeria.
GLO-73-P31	Mortalité des enfants dans le monde et dans l'histoire
GLO-78-P20	Co-ordinating Role of National Committees on Vital and Health Statistics
GLO-78-P22	Reducting Infant and Child Mortality in the Developing World, 1980-2000.
	Can Interventions Make a Difference? The Policy Implications of Field Experiment Experience.
GLO-80-P09	Increase in Mortality of Middle-Aged Males in Japan.
GLO-78-P09	Levels and Trends of Mortality Since 1950.