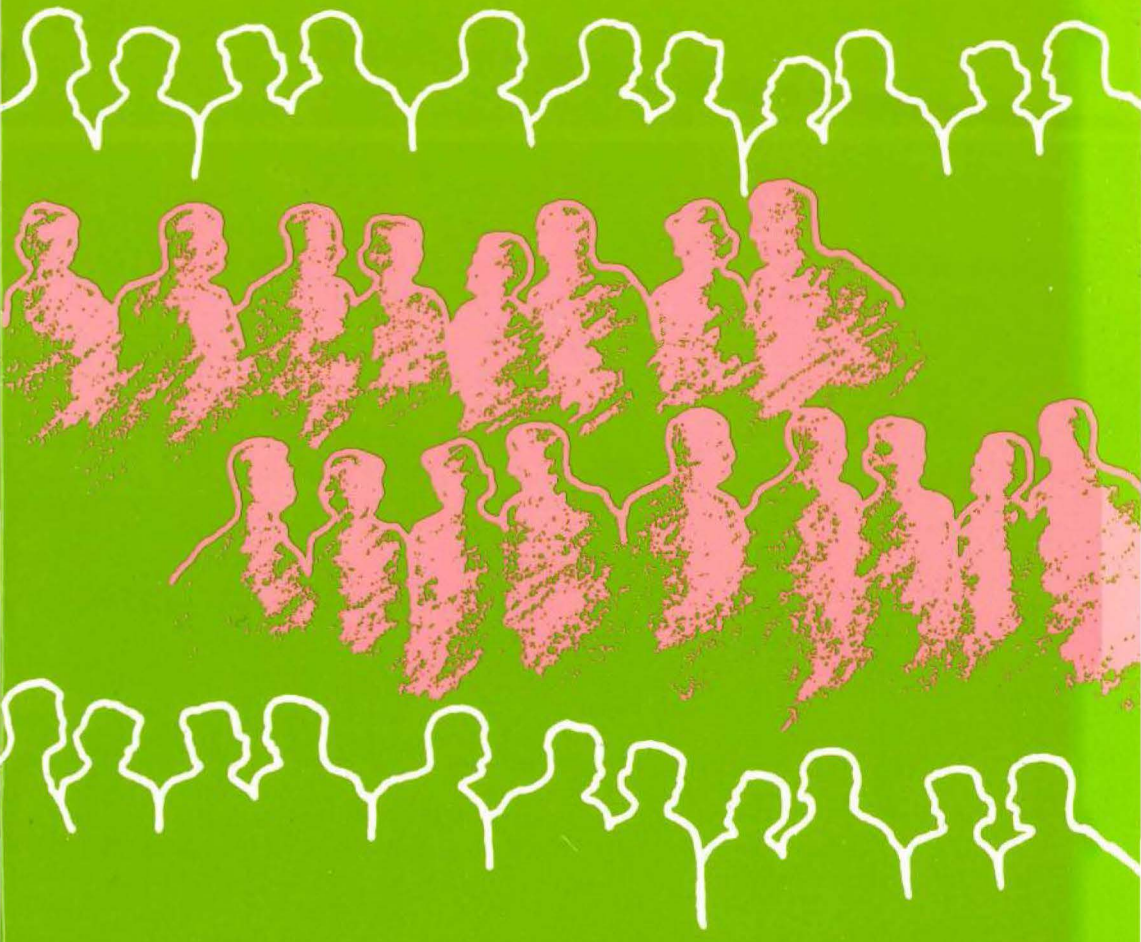
World Population

at the Turn of the Century



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Where the term "country" appears in the headings of tables, it covers countries, territories, cities or areas.

In some tables, the designations "developed" and "developing" economies are intended for statistical convenience and do not necessarily express a judgement about the stage reached by a particular country or area in the development process.

In the present publication, references to "China" are to be understood in the light of General Assembly resolution 2758 (XXVI) of 25 October 1971.

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PREFACE

This is the sixth in a series of periodic reviews of world, regional and international developments in the field of population prepared by the Population Division of the Department of International Economic and Social Affairs of the United Nations Secretariat, in accordance with Economic and Social Council resolution 1347 (XLV) of 30 July 1968.[1]

As in previous concise reports on the world population situation, it has been possible only to suggest the main outlines of the situation. However, special emphasis has been given in the present report to the status of various regions of the world in relation to the demographic transition, in particular to the fertility transition.

Chapter I outlines some of the most significant developments observed recently in the areas of population and economy. Chapter II presents a detailed analysis of the levels and trends of various demographic characteristics, such as population growth, mortality, fertility, age structure and international migration. Chapter III presents an analysis of the developing countries that have entered the demographic transition. A considerable variety of situations are observed and the determinants of fertility and mortality changes are systematically reviewed. Chapter IV focuses on the industrialized countries, where in a number of cases the fertility rate has fallen beyond the replacement level. Chapter V concentrates on the case of Africa, where the transition has hardly begun, and discusses why the process of transition has been so slow in most of the countries of the sub-Saharan region. In contrast, chapter VI, dedicated to the case of China, confirms how exceptional have been the speed and the strength of the demographic transition in a country populated by more than one billion people.

The report, which takes into account information obtained for the 1985 and 1987 rounds of monitoring of world population trends and policies, as well as the *World Population Prospects. Estimates and Projections as Assessed in 1984*,[2] was prepared by Léon Tabah as consultant to the United Nations.

[1] The five earlier reports in this series are: *A Concise Summary of the World Population Situation in 1970; Concise Report on the World Population Situation in 1970-1975 and Its Long-Range Implications; Concise Report on the World Population Situation in 1977: New Beginnings and Uncertain Ends; The World Population Situation in 1979: Conditions, Trends, Prospects, Policies; Concise Report on the World Population Situation in 1983* (United Nations publications, Sales Nos. E.71.XIII.2, E.74.XIII.4, E.78.XIII.9, E.80.XIII.4 and E.83.XIII.6). For a more complete treatment of some topics in the present report, refer to *World Population Trends, Population and Development Interrelations and Population Policies, 1983 Monitoring Report*, vols. I and II (United Nations publications, Sales Nos. E.84.XIII.10 and E.85.XIII.2).

[2] United Nations publication, Sales No. E.86.XIII.3.

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Reference to "dollars" ($) indicates United States dollars, unless otherwise stated.

The term "billion" signifies a thousand million.

Annual rates of growth or change refer to annual compound rates, unless otherwise stated.

A hyphen (-) between years, e.g., 1984-1985, indicates the full period involved, including the beginning and end years; a slash (/) indicates a financial year, school year or crop year, e.g., 1984/85.

A point (.) is used to indicate decimals.

The following symbols have been used in the tables:

Two dots (. .) indicate that data are not available or are not separately reported.

A dash (—) indicates that the amount is nil or negligible.

A hyphen (-) indicates that the item is not applicable.

A minus sign (−) before a number indicates a deficit or decrease, except as indicated.

Details and percentages in tables do not necessarily add to totals because of rounding.

I. TOWARDS NEW UPHEAVALS IN THE WORLD'S DEMOGRAPHIC AND ECONOMIC MAPS

The past 10 years have seen not only the confirmation but even the intensification of the slowdown in world demographic growth owing to the fall in fertility that began between 1960 and 1970 both in the developed countries and in the countries of the third world as a whole.

The rate of increase of world population was 1.86 per cent for 1955-1960 and 2.04 per cent for 1965-1970, but it fell to 1.97 per cent for 1970-1975, 1.75 per cent for 1975-1980 and 1.67 per cent for 1980-1985. The figure of 2.04 per cent has a historic value, for it represents the absolute peak of the world population growth rate and thus, in all probability, will never be seen again. According to the "medium" variant of the United Nations demographic projections, the growth rate will fall below 1 per cent by the end of this century and then continue on a long downward path until the end of the twenty-first century. Of course, long-term projections can be unreliable. As we look further and further ahead in time, the observed data lose their capacity to support the hypotheses and become separated from them, and these hypotheses become a game of the imagination, or even imaginary. Long-term projections should be used with great caution.

However, it is certain that we are witnessing a genuine change in the world with the beginning of what is called the demographic transition of the third-world countries, that is, their progression into a phase of declining fertility accompanied by declining mortality. Like all turnarounds, this one will take time and its effects will extend far beyond the next century as, one after the other, these countries take and proceed along this path, just as today's developed countries did before them in the nineteenth and up to the beginning of the twentieth century.

Together with this growth slowdown, we are witnessing an upheaval in the world demographic map owing to the inevitable staggering of entry into the phase of transition, which, obviously, will not happen at the same time and at the same pace in all countries. Some countries, notably those in Africa south of the Sahara, have not even begun the process, and it would indeed be superficial to view this as merely "historical backwardness", while other countries are rushing ahead so fast that they will reach the end of the process two or three times quicker than many developed countries. This is the case of one country, which is by no means the least, for it is the most densely populated: China.

The changes that will be brought about in the demographic weight of different countries and continents will result ineluctably in the distribution of the economic and political stakes in the world. It is common

knowledge, as Lord Keynes used to say, that big historical events are often caused by slow demographic changes, and it is probable that the population growth rates which will generate increasing differences between North and South, West and East, and among the countries of the South themselves, will help to bring about changes in the relations among nations.

The fact that the population growth rate passed its peak between 1965 and 1970 will not prevent the population from continuing to grow strongly. The absolute growth curve will be spread over a long period of time and it will be a long time before population growth comes to an end; the United Nations postulates that this will happen towards the end of the next century, but this is, of course, pure conjecture.

As the reader reads this paper, the population of the world will be over five billion. According to United Nations calculations, the planet's population was 4,837 million in 1985 and it will be 5,246 million in 1990, still according to the medium variant of the projections. So the milestone of 5 billion will indeed have been passed between the end of 1986 and the spring of 1987.

The population climbs by a billion in an increasingly short space of time until the interval begins to widen with the slowdown in growth. The journey from 3 billion to 4 billion took almost 15 years, between 1960 and 1975. The journey from 4 billion to 5 billion was completed in almost 13 years, between 1975 and 1987. A new increase of a billion, which will bring the population to 6 billion just before the end of this century, will take 12 years, followed by another increment of the same size, which will bring the world population to about 7 billion in 2010.

It is only then that the interval needed for a 1 billion increase will begin to lengthen, and the figure of 8 billion will be reached in about 2024. It is not until then that the world population growth rate will fall below 1 per cent a year (0.93 per cent), and the longer-term calculations, necessarily speculative, show that the population will not stop growing until the end of the twenty-first century. The last small increases in the world population will be produced almost exclusively by Africa during the course of the second half of the twenty-first century.

All these calculations indicate that one after another the populations of countries will finally reach zero growth in the more or less distant future. For the moment, there is no reason to think that the world as a whole is heading towards a stationary state, which will be a kind of common lot of mankind. It is realistic, but hardly convenient for the futurist, to think that some countries, or even some continents, could in fact continue to grow, while others could shrink, and still others fluctuate around the stationary line or at a distance from it. It is already established that the industrialized countries are now basically in a phase of decrease and that they owe their present increase, which is slight but will continue until the beginning of the next century, only to a growth potential accumulated in the age structures during the past period of demographic expansion. This potential will inevitably exhaust itself, just as a sum of capital disappears

when not renewed, if the present situation with respect to fertility, mortality and international migration continues for a sufficiently long time. Other countries, in contrast, have not yet even entered the first phase of the transition and they are even experiencing increased fertility and higher growth rates. This is the case of many of the countries south of the Sahara.

A striking feature of the comparative evolution of the demography of the developed countries at the time of their transition and of the third-world countries today is that at no point in their history did the growth rates of the developed countries exceed 1.5 per cent, whereas these rates have often exceeded 3 per cent in the third world. This also happened in the Latin American countries as a whole two decades ago and it is happening in the African countries today.

The industrialized countries underwent the demographic transition in much better economic conditions than the current conditions in the third world. In 1877, the same time that Annie Besant was convicted of having distributed contraceptive propaganda, in a celebrated case in wealthy Victorian England, a time that corresponded roughly to the beginning of the demographic transition in that country, the fertility level in England was lower than it is today in many developing countries, but the mortality level was much higher, so that the growth rate was much lower. In 1889, when the French built the Eiffel Tower, France was well into the transition, being well ahead of all the other countries in this respect. France was a prosperous country in comparison with the third world, but its mortality was also much higher than that of Mexico in 1985, for example. The average life-span in Mexico is about 67 years. This was the level for the population of France in 1950 or of England a little earlier, times when the transition was over in those two countries.

It is surprising to note that the mortality rate of many third-world countries beginning their demographic transition is comparable to the rate of the industrialized countries at the time when they were completing their transition and were in full economic growth. Progress in the area of health has been much faster than economic progress in the third world.

Today, therefore, the developing countries have higher fertility and much lower mortality than the developed countries at the time of their transition, which was also the time of their industrialization. One explanation of the higher mortality of the industrialized countries at the dawn of the century, when their economic development was going full steam ahead, is that knowledge of the causes of diseases and their treatment, especially in children, was not so advanced, even among the leisured classes, as it is today both in the medical services and in the population itself, no matter how poor. But the main reason is that the countries of the third world benefit from the application of scientific discoveries to medicine, such as the use of antibiotics, a sort of "injection of civilization", to use Alfred Sauvy's term, discoveries that have played a decisive role in reducing their mortality.

No description of what may happen to world demography in the distant future would be complete without a glance at the evolution of living

conditions during the past two decades, for they serve as a kind of springboard for the future. Demographic and economic changes are closely linked, although the workings of these links are not always known. The least that can be said is that the economic performance during these two decades has been on the whole disappointing.

The industrialized countries have experienced two recessions which, although far from comparable in size to the Great Depression of the 1930s, were nevertheless the most serious in the post-war period and associated with changes in demographic behaviour. These changes, in particular the declines in fertility, were more marked than in the 1930s when the economic upheavals were more profound, with much higher unemployment rates at a time when social security legislation was less advanced.

High inflation was a feature of the first recession in 1973-1974. But the second one, in 1980-1983, was characterized, as a kind of reaction, by deflation. The counter-shock was no less powerful than the shock itself in the third world. The oil-price increase and the deflationary policies adopted since 1980 were superimposed on a deteriorating economic performance. It can also be said that the demographic crisis of the rich countries began earlier (in about 1965, in so far as it is possible to determine the starting point of such a weighty phenomenon as demographic evolution). The economic and demographic crises had been brewing for a long time. We do not know the deep roots of one any better than those of the other.

In any event, the growth rate of the gross domestic product (GDP) of the industrialized countries peaked at 6.1 per cent in 1973 and this level has never been reached since. It was only 0.8 per cent in 1974 and fell to 0.4 per cent in 1975. During the second recession, in 1980-1983, the GDP growth rate was only 1.3 per cent in 1980 and 1981 and it was even negative in 1982 (-0.5 per cent).

The two recessions caused a slowdown in labour productivity in the industrialized countries and a rise in unemployment which has not yet been contained, with rates three times higher than in the 1960s in many European countries, together with a decline in real saving and in international trade.

The alternation of a period of high inflation with one of deflation, which has still not run its course, has had an adverse effect on international trade and could not fail to affect the development of the third-world countries. The demand cutback in the rich countries during the 1973-1974 recession hurt those developing countries that exported neither oil nor manufactured goods. The growth of foreign debt has been accelerating since the beginning of the oil crisis, with the oil-importing countries borrowing to cover the increase and the oil-producing countries financing ambitious development programmes, as if the miraculous manna would remain forever. The abrupt rise in real interest rates hit all countries hard from 1979, regardless of whether they were producers and exporters of oil, particularly in Latin America (Argentina, Brazil, Chile, Mexico and Venezuela), but also in Africa (Nigeria) and to a lesser extent in Asia (the

Philippines and the Republic of Korea). The mistake of financing growth by borrowing, which is a mistake of both lenders and borrowers, has created an enormous liquidity crisis.

Most of the African countries have been particularly hard hit. It must be added that in their case the natural environment aggravated the unfavourable conditions of the international economic situation as the continent underwent one of its longest periods of drought. Africa is one of the regions of the world particularly vulnerable to climatic hazards. It is estimated that the per capita income of Africans fell considerably throughout the period 1974-1981, which did not happen elsewhere in the third world.

Accordingly, almost all of the developing countries saw their situation worsen in all respects during the 1980-1983 recession. The terms of trade deteriorated owing to the weak demand in the rich countries, which moreover seem to be depending less and less on imports of raw materials in their new development styles based on technological innovation. Only the low-income countries of the third world, which had begun a series of reforms in the 1970s to secure their better integration in the world economy (more flexible economic structures, stimulation of domestic saving) and which had borrowed little in the world capital market, were able to maintain a relatively satisfactory growth rate, one at least clearly higher than the demographic growth rate. The exceptions are ones of size, for they include the world's two biggest countries in terms of population—China and India—and to some extent certain other Asian countries, such as Malaysia, the Republic of Korea and Thailand. These countries, and it cannot be a coincidence, are the most advanced in the demographic transition.

In 1986, the world economic outlook seemed better for the rich countries, with lower inflation and the sharp fall in the prices of raw materials. But this fall is a serious handicap for most developing countries. The debt of these countries has continued to grow, to the point where debt service absorbs an increasing part of foreign earnings, sometimes as high as 25 per cent.

Discussions in international forums about the solutions required for current problems, in particular the problem of the third world's foreign debt, receive more attention from the leaders of these countries than long-term problems such as population. Of course, if the indebtedness becomes chronic it may soon leave the ranks of short-term or medium-term problems and take its place among the long-term ones.

There was one factor favourable for Africa in 1986: a glimmer of hope in what seems to be the end of the period of drought, although some authors think it is cyclical. In food production, the growing proof of the success of modern farming technologies following the Green Revolution in many countries of Asia and Latin America is a further reason for hope and may improve the ratios between demographic growth and the food supply.

II. MAIN DEMOGRAPHIC CHARACTERISTICS

A. GROWTH

The world population was about 680 million in 1770, 950 million in 1800 and 1.6 billion in 1900. Table 1 shows, in greater and more specific detail, the changes for the main regions since 1950 and the expected figures up to 2025.

TABLE 1. EVOLUTION OF THE WORLD POPULATION, BY MAIN REGION
(In millions)

	1950	*1985*	*2000*	*2025*
World	2 516	4 837	6 122	8 206
Developed countries	832	1 174	1 277	1 396
	(33.1)	(24.3)	(20.9)	(17.0)
Developing countries	1 684	3 663	4 846	6 809
	(66.9)	(75.7)	(79.2)	(83.0)
Africa	224	555	872	1 617
	(8.9)	(11.5)	(14.2)	(19.7)
Latin America	165	405	546	779
	(6.6)	(8.4)	(8.9)	(9.5)
Asia	1 376	2 818	3 549	4 535
	(54.7)	(58.3)	(58.0)	(55.3)
China	555	1 060	1 256	1 475
	(22.1)	(21.9)	(20.5)	(18.0)
India	358	759	964	1 229
	(14.2)	(15.7)	(15.8)	(15.0)
Europe	392	492	512	524
	(15.6)	(10.2)	(8.4)	(6.4)
United States of America	152	238	268	312
	(6.0)	(4.9)	(4.4)	(3.8)
Union of Soviet Socialist Republics	180	278	315	368
	(7.2)	(5.7)	(5.1)	(4.5)

Source: World Population Prospects. Estimates and Projections as Assessed in 1984 (United Nations publication, Sales No. 86.XIII.3).

More detailed data will be found in table 2.

As stated above, the world population increased from 2.5 billion in 1950 to 4.8 billion in 1985, and it will be 8.2 billion in 2025. This growth is due mainly to the developing countries, whose population increased from 1.7 billion in 1950 to 3.7 billion in 1985, that is more than doubling in 35 years; by 2025 it will grow to 6.8 billion, almost redoubling in 40 years. On the other hand, the population of the developed countries increased from 832 million in 1950 to 1.2 billion in 1985 and will be 1.4 billion in 2025. Of course, the shares of these two groups of countries fol-

TABLE 2. POPULATION BY MAIN REGIONS OF THE WORLD
(In millions)

	1950	*1960*	*1970*	*1980*	*1990*	*2000*	*2010*	*2020*	*2025*
World	2 516	3 019	3 693	4 450	5 246	6 122	6 989	7 822	8 206
Developed countries	832	945	1 047	1 137	1 210	1 277	1 331	1 377	1 396
Developing countries	1 684	2 074	2 646	3 313	4 036	4 845	5 658	6 446	6 809
Africa	224	280	361	479	645	872	1 158	1 468	1 617
East Africa	63	80	106	143	196	272	373	484	537
Central Africa	27	33	40	52	69	92	122	154	170
North Africa	52	65	83	108	140	176	211	245	261
Southern Africa	17	21	26	33	42	55	69	84	91
West Africa	65	81	106	144	199	277	383	501	558
Americas	331	415	510	613	726	844	959	1 072	1 124
Latin America	165	217	283	361	451	546	642	735	779
Caribbean	17	20	25	30	35	41	48	55	58
Central America	37	50	68	92	119	149	179	209	223
Temperate South America	25	31	36	42	49	55	61	67	70
Tropical South America	86	116	154	198	248	301	354	405	429
North America	166	199	227	252	275	297	317	337	345
Asia	1 376	1 668	2 102	2 584	3 058	3 549	3 982	4 365	4 535
East Asia	671	791	986	1 176	1 324	1 475	1 589	1 679	1 721
China	555	657	831	996	1 124	1 256	1 355	1 436	1 475
Japan	84	94	104	116	124	130	133	133	132
Others	33	40	51	63	76	89	101	110	114
South Asia	704	876	1 116	1 408	1 734	2 074	2 394	2 686	2 814
South-Eastern Asia	182	226	288	361	439	520	593	659	688
Southern Asia	480	595	754	949	1 165	1 387	1 592	1 777	1 855
Western Asia	42	56	74	98	130	168	209	250	271
Europe	392	425	459	485	499	512	520	523	524
Eastern Europe	89	97	103	109	115	120	125	129	131
Northern Europe	72	76	80	82	83	84	84	84	84
Southern Europe	109	118	128	140	145	152	156	158	159
Western Europe	122	134	148	154	155	156	154	152	150
Oceania	13	16	19	23	26	30	33	36	38
Union of Soviet Socialist Republics	180	214	242	265	292	315	337	358	368

Source: World Population Prospects. Estimates and Projections as Assessed in 1984 (United Nations publication, Sales No. 86.XIII.3).

low diverging paths: the third world's share will increase from 69.9 per cent in 1950 to 83 per cent in 2025, while that of the industrialized countries will fall by almost half, from 33.1 to 17 per cent. Thus, at the end of the first quarter of the next century more than four out of five of the planet's inhabitants will be the survivors or descendants of today's third world. The inhabitants of the industrialized countries, who accounted for a third of the world population in 1950, will represent less than a fifth in 2025.

Asia remains by far the leading continent from the demographic standpoint, supplying more than half the world population, with a share that rose between 1950 and 1985 from 54.7 to 58.3 per cent, but will fall back to the 1950 level (55.3 per cent) in 2025. China provides the main reason for the expected decline. China's share remained almost constant from 1950 to 1985 at 22 per cent and it will fall to 18 per cent in 2025. By 2025 its population will account for almost the same share as the whole of the developed countries at that date.

The Chinese are not the only big population mass of the third world that will decline as a proportion of the total between now and 2025. India's population is creeping ever closer to the population of China and will change slightly as a proportion of the world population from 15.7 per cent in 1985 to 15.8 per cent in 2000 and 15 per cent in 2025. Longer-term calculations show that the population of India will overtake that of China by about the middle of the next century.

Africa has the strongest growth. The share of the African continent will increase from 8.9 per cent of the world population in 1950 to 19.7 per cent in 2025, that is, much more than the total of the developed countries; in 1950 it was equal to only a quarter thereof.

Europe is literally melting away like snow in the sun, slipping from 15.6 per cent of the world population in 1950 to 10.2 per cent in 1985 and 6.4 per cent in 2025. The shares of the United States and the USSR are also declining, but to a lesser extent than Europe is; they will both grow at roughly the same rate, doubling between 1950 and 2025. It should be noted that the populations of the United States and the USSR are expected to almost equal the combined population of Northern, Southern and Western Europe in 2025, whereas they represented only 60 per cent thereof in 1950.

As table 3 shows, the growth rates of all the regions and subregions of the world declined between 1970-1975 and 1980-1985, with the sole exception of Africa as a whole and its subregions, where the growth rates advanced without exception. This advance is particularly strong in North Africa owing to the considerable increase in life expectancy. But the record growth rate belongs to East Africa, with 3.1 per cent in 1980-1985 — unprecedented at the regional level.

Of the developing countries, China had the strongest growth rate during those 10 years, the 1980-1985 rate being 56 per cent of the 1970-1975 rate. Of the developed countries, those in Western Europe have the record decline, with a rate currently close to zero. Japan also experienced a sharp

TABLE 3 PRINCIPAL DEMOGRAPHIC CHARACTERISTICS BY MAIN REGIONS OF THE WORLD, 1970-1975 AND 1980-1985

	Gross rate (per hundred)			*Total fertility rate*			*Life expectancy at birth*			*Infant mortality (per thousand)*		
	1970-1975	*1980-1985*	*Change* (%)*	*1970-1975*	*1980-1985*	*Change (%)*	*1970-1975*	*1980-1985*	*Change* (%)*	*1970-1975*	*1980-1985*	*Change (%)*
World	1.97	1.67	−15.2	4.44	3.52	−20.7	56.6	59.5	5.1	93	78	−16.1
Developed countries	0.89	0.64	−28.1	2.17	1.97	−9.2	71.3	73.1	2.5	22	16	−27.3
Developing countries	2.39	2.01	−15.9	5.40	4.06	−24.8	54.1	57.3	5.9	104	88	−15.4
Africa	2.72	2.92	7.3	6.50	6.34	−2.5	45.7	49.4	8.1	142	112	−21.1
East Africa	2.86	3.10	8.4	6.76	6.82	0.9	44.8	47.3	5.6	131	120	−8.4
Central Africa	2.58	2.71	5.0	5.99	6.02	0.5	43.8	47.8	9.1	136	117	−14.0
North Africa	2.41	2.64	9.5	6.30	5.55	−11.9	50.9	56.5	11.0	138	100	−27.5
Southern Africa	2.32	2.54	9.4	5.43	5.21	−4.1	49.0	53.0	8.1	112	87	−22.3
West Africa	2.98	3.12	4.9	6.84	6.86	0.3	43.3	47.2	9.0	153	123	−19.6
Americas	1.87	1.72	−8.0	3.63	3.14	−13.5	63.6	66.8	5.0	64	49	−23.4
Latin America	2.50	2.27	−9.2	5.01	4.09	−18.4	60.7	64.2	5.8	80	62	−22.5
Caribbean	1.99	1.53	−23.1	4.54	3.34	−26.4	62.0	64.2	3.5	77	65	−15.6
Central America	3.14	2.67	−15.0	6.36	4.83	−24.1	61.0	64.8	6.2	75	57	−24.0
Temperate South America	1.59	1.52	−4.4	3.22	3.11	−3.4	66.4	69.7	5.0	55	32	−41.8
Tropical South America	2.51	2.35	−6.4	4.95	4.08	−17.6	59.5	63.0	5.9	88	69	−21.6
North America	1.05	0.90	−14.3	1.95	1.83	−6.2	71.5	74.4	4.1	18	11	−38.9
Asia	2.26	1.74	−23.0	5.06	3.54	−30.0	55.6	59.1	6.3	97	83	−14.4
East Asia	2.11	1.22	−42.2	4.37	2.34	−46.5	63.8	68.4	7.2	57	36	−36.8
China	2.20	1.23	−44.1	4.74	2.36	−50.2	63.2	67.8	7.3	61	39	−36.1
Japan	1.33	0.66	−50.4	2.08	1.79	−13.9	73.3	76.9	4.9	12	6	−50.0
Others	2.21	1.91	−13.6	4.29	3.00	−30.1	62.0	67.9	9.5	46	29	−37.0
South Asia	2.40	2.16	−10.0	5.67	4.59	−19.0	50.3	54.9	9.1	125	103	−17.6
South-Eastern Asia	2.38	2.06	−13.4	5.43	4.11	−24.3	51.5	57.1	10.9	96	73	−24.0
Southern Asia	2.35	2.14	−8.9	5.73	4.72	−17.6	49.3	53.5	8.5	136	115	−15.4
Western Asia	2.91	2.79	−4.1	6.02	5.22	−13.3	56.3	61.0	8.3	118	81	−31.3
Europe	0.64	0.30	−53.1	2.16	1.88	−13.0	71.4	73.1	2.4	24	15	−37.5
Eastern Europe	0.55	0.53	−3.6	2.20	2.18	−0.9	70.2	71.1	1.3	28	19	−32.1
Northern Europe	0.33	0.15	−54.5	2.05	1.86	−9.3	72.4	74.0	2.2	16	10	−37.5
Southern Europe	0.98	0.44	−55.1	2.47	1.93	−21.9	71.3	73.3	2.8	31	17	−45.2
Western Europe	0.58	0.14	−75.9	1.89	1.63	−13.8	71.8	74.3	3.5	18	10	−44.4
Oceania	1.78	1.56	−12.4	3.15	2.65	−15.9	65.8	67.9	3.2	39	31	−20.5
USSR	0.93	0.96	3.2	2.44	2.35	−3.7	69.8	70.9	1.6	26	25	−3.8

Source: World Population Prospects. Estimates and Projections as Assessed in 1984 (United Nations publication, Sales No. 86.XIII.3).

fall in its growth rate, from 1.33 per cent in 1970-1975 to 0.66 per cent in 1980-1985. Japan now has a total fertility rate close to those of Northern, Western and Southern Europe, with the longest life expectancy of all those given in table 4 (76.9 years) and with the lowest infant mortality rate (6 per thousand).

B. Mortality

All the mortality data in this document are expressed in terms of life expectancy at birth rather than as gross mortality rates, for these rates are too heavily influenced by the population age structure, which has a parasitic effect on the measurement of the phenomenon as it varies greatly from one population to another. In the industrialized countries, for example, the proportion of young people (0-15 years) is approximately half that of the developing countries, and the proportion of old people (60 years and over) two to three times larger. Thus, comparison of the gross mortality rates of these two types of country might confuse the reader.

This analysis is based, for the developing countries, on survey data rather than on civil status data, which are too often lacking or flawed, especially in Africa and Asia, and even in several countries of Latin America. The gaps in the knowledge of mortality for these countries also relate more to the adult ages than to the first years of life, for which surveys have been made, especially with respect to fertility, a subject that has been more widely studied in the third world than mortality.

First observation. Differences between rich and poor countries

The "Over-70s Club"

The first striking observation is the great difference in life expectancy at birth between the industrialized and the developing countries: 73.1 years against 57.3 years. The gap has closed a little during the past 10 years, with life expectancy advancing by 2.5 per cent in the first group and 5.9 per cent in the second. But when the regions and subregions of the world or individual countries are compared, the gaps are wide. Between West Africa, where life expectancy at birth is 47.2 years, and Western Europe, where it is 74.3 years, the gap is 27.1 years. Between Japan, where life expectancy is 76.9 years, and the Gambia, where it is 35 years, the gap is more than double. An effort at imagination is needed to understand the meaning of such differences in life span and their implications for the quality of life.

In 1950-1955 only five countries (Denmark, Iceland, Netherlands, Norway and Sweden) belonged to what is called the "Over-70s Club",[1] that is, the countries in which life expectancy at birth is more than 70 years, but by 1980-1985 the number of these countries had increased to 47, with 9 in Latin America, 6 in Asia, 32 in Europe, North America and Oceania, and none in Africa. Since then, all the industrialized countries have belonged to the Club (see table 5). It should be noted that it is rare for a country to slip back out of the Club once it has joined. In 2000-

TABLE 4. LIFE EXPECTANCY AT BIRTH (e_0) AND TOTAL FERTILITY RATE (TFR)

Region and country	1950-1955		1980-1985		2000-2005		2020-2025	
	e_0	TFR	e_0	TFR	e_0	TFR	e_0	TFR
Total Africa	37.8	6.47	49.4	6.34	58.9	4.92	64.5	3.17
East Africa	36.6	6.54	47.3	6.82	57.4	5.58	63.1	3.38
Burundi	40.0	5.44	46.5	6.44	56.5	4.34	62.5	2.42
Comoros	40.0	6.27	50.0	6.29	60.0	3.27	65.6	2.03
Ethiopia	32.9	6.70	40.9	6.70	49.9	5.66	55.9	3.55
Kenya	38.6	8.20	52.9	8.12	63.5	5.77	68.1	3.17
Madagascar	37.7	5.70	49.6	6.09	58.1	5.05	62.7	3.04
Malawi	36.2	6.78	45.0	7.00	55.0	5.79	61.0	3.43
Mauritius	51.0	6.28	66.7	2.76	72.3	2.09	74.2	2.09
Mozambique	37.4	5.42	45.3	6.09	55.3	5.05	61.3	3.04
Uganda	40.0	6.91	49.0	6.90	59.0	5.79	65.0	3.55
Réunion	52.6	5.69	69.7	2.23	74.7	2.07	76.4	2.05
Rwanda	40.0	5.97	46.5	7.51	56.5	5.99	62.5	3.29
Somalia	32.9	6.60	40.9	6.60	49.9	5.60	55.9	3.55
United Republic of Tanzania	37.0	6.74	51.0	7.10	61.0	5.89	66.5	3.55
Zambia	37.8	6.59	51.3	6.76	61.3	5.68	67.0	3.55
Zimbabwe	41.5	6.61	55.8	6.60	65.5	5.56	70.0	3.55
Central Africa	36.8	5.89	47.8	6.02	58.0	5.04	64.0	3.09
Angola	30.0	6.39	42.0	6.39	52.0	5.46	58.0	3.55
Cameroon	35.9	5.76	50.9	5.79	60.9	4.81	66.9	2.94
Chad	32.5	5.77	43.0	5.89	53.0	4.87	59.0	2.94
Congo	36.0	5.69	46.5	5.99	56.5	4.97	62.5	2.98
Gabon	38.0	4.06	49.0	4.51	59.0	4.43	65.0	3.04
Equatorial Guinea	33.5	5.50	44.0	5.66	54.0	4.71	60.0	2.96
Central African Republic	34.0	5.52	43.0	5.89	53.0	4.87	59.0	2.94
Zaire	40.5	5.98	50.0	6.09	60.0	5.05	66.0	3.04
North Africa	41.9	6.76	56.5	5.55	67.0	2.97	71.1	2.33
Algeria	43.1	7.28	60.1	6.66	70.3	2.87	73.4	2.25
Egypt	42.4	6.56	58.1	4.82	69.2	2.66	72.7	2.15

TABLE 4 (*continued*)

Region and country	1950-1955 e_0	1950-1955 TFR	1980-1985 e_0	1980-1985 TFR	2000-2005 e_0	2000-2005 TFR	2020-2025 e_0	2020-2025 TFR
Jordan	37.2	6.68	47.7	6.58	60.0	4.29	66.0	2.76
Libyan Arab Jamahiriya	42.9	6.87	58.3	7.17	69.3	4.30	72.8	2.77
Morocco	42.9	7.17	58.3	5.13	69.3	2.26	72.8	2.15
Sudan	37.2	6.68	47.7	6.58	60.0	4.29	66.0	2.76
Tunisia	44.6	6.87	60.6	4.82	70.5	2.36	73.5	2.15
Southern Africa	41.2	5.60	53.0	5.21	62.9	3.94	68.4	2.76
South Africa	41.5	5.55	53.5	5.07	63.5	3.74	68.9	2.67
Botswana	42.5	6.27	54.5	6.50	64.4	5.52	69.5	3.55
Lesotho	37.3	5.84	49.3	5.79	59.3	4.81	65.2	2.94
Namibia	38.7	5.87	48.2	6.09	58.2	5.05	64.1	3.04
Swaziland	41.0	5.96	48.5	6.50	58.5	5.52	64.5	3.55
West Africa	35.5	6.62	47.2	6.86	57.5	5.71	63.5	3.50
Benin	32.5	6.74	44.0	7.00	54.0	5.79	60.0	3.43
Burkina Faso	32.5	6.52	45.2	6.50	55.2	5.52	61.2	3.55
Cape Verde	42.6	6.50	59.0	4.77	66.9	2.96	74.3	2.13
Côte d'Ivoire	36.0	6.65	50.5	6.70	60.5	5.07	66.5	2.96
Gambia	30.6	5.87	35.0	6.39	45.0	5.46	51.0	3.55
Ghana	42.0	6.37	52.0	6.50	62.0	5.52	67.5	3.55
Guinea	30.7	6.58	40.2	6.19	50.2	5.27	56.2	3.45
Guinea-Bissau	35.5	5.05	43.0	5.38	53.0	4.45	59.0	3.33
Liberia	37.5	6.22	49.0	6.90	59.0	5.79	65.0	3.55
Mali	32.5	6.36	42.0	6.70	52.0	5.66	58.0	3.55
Mauritania	33.5	6.71	44.0	6.90	54.0	5.52	60.0	3.55
Niger	33.0	6.86	42.5	7.10	52.5	5.89	58.5	3.55
Nigeria	36.5	6.77	48.5	7.10	58.5	5.89	64.5	3.55
Senegal	34.7	6.64	43.3	6.50	53.3	5.52	59.3	3.55
Sierra Leone	29.0	6.12	34.0	6.13	44.0	5.05	50.0	3.04
Togo	36.0	6.11	50.5	6.09	60.5	5.05	66.5	3.04
Americas	57.7	4.63	66.8	3.14	71.8	2.52	73.6	2.32
Latin America	51.1	5.86	64.2	4.09	70.2	2.73	72.3	2.40
Caribbean	51.9	5.16	64.2	3.34	68.6	2.81	70.8	2.60
Barbados	57.2	4.65	72.7	1.94	76.2	2.08	77.1	2.08
Cuba	58.8	4.01	73.4	1.97	75.0	2.10	75.1	2.09
Dominican Republic	45.1	7.50	62.6	4.18	70.2	2.60	72.4	2.35
Guadeloupe	56.5	5.57	72.4	2.55	76.1	2.08	76.9	2.08
Haiti	37.6	6.15	52.7	5.74	61.9	4.57	66.0	3.49
Jamaica	57.2	4.24	73.0	3.37	76.3	2.08	77.2	2.08
Martinique	56.5	5.67	73.2	2.14	76.4	2.08	77.4	2.08
Puerto Rico	64.8	5.02	74.0	2.54	76.7	2.07	77.4	2.07
Trinidad and Tobago	57.9	5.33	68.7	2.88	74.1	2.10	76.1	2.10
Other Caribbean	57.6	4.93	70.7	2.86	75.1	2.08	76.6	2.08
Central America	49.3	6.76	64.8	4.83	71.4	2.80	73.0	2.52
Costa Rica	57.3	6.72	73.0	3.50	74.8	2.53	75.2	2.21
El Salvador	45.3	6.46	64.8	3.56	72.5	3.63	73.1	2.80
Guatemala	42.1	7.09	59.0	6.12	70.4	3.97	72.3	2.92
Honduras	42.2	7.05	59.9	6.50	70.7	4.38	72.2	3.20
Mexico	50.7	6.74	65.7	4.61	71.4	2.50	73.2	2.26
Nicaragua	42.3	7.34	59.8	5.94	71.2	3.57	72.6	2.68
Panama	55.3	5.68	71.0	3.46	73.9	2.34	74.3	2.12
Temperate South America	60.2	3.52	69.7	3.11	72.9	2.38	74.0	2.21
Argentina	62.7	3.16	69.7	3.38	73.0	2.43	74.0	2.22
Chile	53.7	4.90	69.7	2.59	72.7	2.27	74.1	2.18
Uruguay	66.3	2.73	70.3	2.76	72.8	2.25	73.4	2.16
Tropical South America	50.2	6.36	63.0	4.08	69.5	2.74	71.9	2.39
Bolivia	40.4	6.74	50.7	6.25	63.6	4.73	67.2	3.50
Brazil	51.0	6.15	63.4	3.81	69.6	2.55	72.1	2.28
Colombia	50.6	6.72	63.6	3.93	68.8	2.61	71.3	2.31
Ecuador	48.4	6.91	64.3	5.00	69.8	3.44	72.4	2.84
Guyana	55.2	6.64	68.2	3.26	73.9	2.09	75.9	2.09
Paraguay	51.9	6.62	65.1	4.85	69.5	3.14	71.7	2.56
Peru	43.9	6.87	58.6	5.00	69.8	2.79	72.0	2.26
Suriname	56.0	6.56	68.0	3.59	73.7	2.09	75.7	2.09
Venezuela	55.2	6.46	69.0	4.10	72.1	2.92	73.7	2.60
North America	69.1	3.43	74.4	1.83	76.8	2.08	77.5	2.10
Canada	69.1	3.71	75.7	1.71	77.3	1.94	78.1	2.10
United States	69.0	3.45	74.3	1.85	76.7	2.10	77.5	2.10
Asia	41.2	5.87	59.1	3.54	68.1	2.32	72.1	2.11
East Asia	42.7	5.68	68.4	2.34	74.0	1.93	75.9	2.10
China	40.8	6.21	67.8	2.36	73.7	1.91	75.7	2.11
Japan	63.9	2.77	76.9	1.79	77.9	2.02	78.2	2.09
Other East Asia	48.2	5.00	67.9	3.00	73.8	2.18	75.9	2.02
Hong Kong	61.0	3.60	75.5	1.91	76.6	2.06	77.1	2.07
Korea	47.5	5.10	67.7	3.04	73.7	2.15	75.9	2.00

Region and country	1950-1955 e_0	1950-1955 TFR	1980-1985 e_0	1980-1985 TFR	2000-2005 e_0	2000-2005 TFR	2020-2025 e_0	2020-2025 TFR
Democratic People's Rep. of Korea	47.5	5.15	67.7	4.02	73.7	2.47	75.9	2.06
Rep. of Korea	47.5	5.15	67.7	2.60	73.7	1.96	75.9	1.96
Mongolia	45.0	5.75	62.0	5.12	71.2	3.28	74.1	2.46
South Asia	39.9	6.04	54.9	4.59	65.5	2.59	70.1	2.12
South-Eastern Asia	41.2	5.80	57.1	4.11	67.6	2.33	71.8	2.04
Burma	40.0	5.64	57.5	4.10	68.8	2.42	72.6	2.15
Democratic Kampuchea	39.4	6.29	43.4	5.12	58.3	2.46	64.5	2.05
East Timor	30.0	6.44	39.9	5.84	52.5	3.28	59.5	2.25
Indonesia	37.5	5.49	53.5	4.10	65.8	2.25	70.8	2.05
Lao People's Dem. Rep.	40.4	5.75	49.7	5.84	61.4	3.28	67.1	2.25
Malaysia	48.5	6.80	66.8	3.91	73.3	2.16	75.6	1.85
Philippines	47.5	7.25	61.9	4.41	69.3	2.47	72.6	2.06
Singapore	60.4	6.32	71.8	1.69	75.7	2.05	76.9	2.10
Thailand	47.0	6.62	62.7	3.52	69.6	2.36	73.1	2.05
Viet Nam	40.4	5.03	58.8	4.30	68.8	2.25	72.7	1.95
Southern Asia	38.9	6.11	53.5	4.72	64.1	2.58	68.9	2.08
Afghanistan	31.6	6.70	37.0	6.90	47.6	4.50	55.1	2.73
Bangladesh	36.6	5.72	47.8	6.15	57.0	3.38	62.5	2.46
Bhutan	36.3	6.02	45.9	5.53	55.5	3.69	61.8	2.46
India	38.7	5.97	55.4	4.30	67.2	2.25	71.6	1.95
Iran, Islamic Republic of	46.1	8.50	57.3	5.64	67.2	3.07	72.0	2.15
Nepal	36.3	5.64	45.9	6.25	55.9	3.69	61.8	2.46
Pakistan	38.9	6.96	50.0	5.84	60.5	3.28	66.3	2.25
Sri Lanka	56.6	5.70	68.4	3.38	74.0	2.05	76.0	1.84
Western Asia	45.1	6.37	61.0	5.22	70.0	3.44	73.4	2.56
Arab countries	41.9	6.94	60.0	6.72	69.4	4.09	73.0	2.67
Bahrain	51.0	6.97	69.2	4.63	74.5	2.89	76.3	2.46
Democratic Yemen	33.4	6.97	48.4	6.76	60.9	4.35	67.8	2.77
Iraq	44.0	7.17	62.4	6.66	70.9	3.69	73.8	2.46
Jordan	43.2	7.17	63.7	7.38	71.9	5.43	74.6	3.14
Kuwait	55.8	7.28	71.6	6.15	75.7	3.44	76.9	2.46
Lebanon	56.0	5.74	65.0	3.79	72.9	2.56	75.1	2.36
Oman	36.4	7.17	52.3	7.07	66.3	4.35	71.0	2.77
Qatar	48.0	6.97	67.6	6.76	73.7	4.35	75.8	2.77
Saudi Arabia	39.9	7.17	60.9	7.07	70.9	4.35	73.9	2.77
Syrian Arab Republic	46.0	7.09	62.6	7.17	71.4	3.69	74.3	2.46
United Arab Emirates	48.0	6.97	67.6	5.94	73.7	3.22	75.8	2.42
Yemen	33.4	6.97	48.4	6.97	60.9	5.21	67.8	3.07
Non-Arab countries	48.1	5.91	62.5	3.81	71.3	2.56	74.1	2.37
Cyprus	67.0	3.69	74.0	2.43	76.8	2.25	77.6	2.20
Israel	65.4	4.16	74.4	3.09	77.1	2.33	77.7	2.27
Turkey	47.0	6.15	61.6	3.96	70.8	2.63	73.8	2.42
Europe	65.3	2.56	73.1	1.88	76.3	1.90	77.2	2.05
Eastern Europe	63.2	2.91	71.1	2.18	75.4	2.06	76.7	2.12
Bulgaria	64.1	2.50	71.6	2.25	75.6	2.08	76.8	2.13
Czechoslovakia	65.9	2.89	71.0	2.11	75.4	2.06	76.7	2.09
German Democratic Republic	67.0	2.37	72.1	1.88	76.0	2.04	77.0	2.10
Hungary	63.9	2.74	70.3	1.86	74.8	1.88	76.4	2.00
Poland	61.3	3.63	71.2	2.26	75.5	2.02	76.6	2.10
Romania	61.1	2.87	70.2	2.43	74.8	2.20	76.6	2.20
Northern Europe	69.4	2.29	74.0	1.86	76.7	1.86	77.4	2.03
Denmark	71.0	2.53	74.5	1.47	76.8	1.47	77.5	1.64
Finland	66.3	2.98	73.8	1.67	76.6	1.70	77.3	1.84
Iceland	72.0	3.70	76.8	2.40	78.0	1.81	78.3	1.92
Ireland	66.9	3.36	73.0	3.09	76.4	2.19	77.3	1.96
Norway	72.7	2.60	76.0	1.71	77.4	1.67	78.1	2.02
Sweden	71.8	2.22	76.3	1.64	77.8	1.60	78.1	1.95
United Kingdom	69.2	2.19	73.7	1.90	76.6	1.95	77.3	2.12
Southern Europe	63.0	2.64	73.3	1.93	76.4	1.94	77.3	2.03
Albania	55.2	5.57	70.9	3.60	75.3	2.62	76.8	2.47
Greece	65.9	2.27	74.0	2.15	76.8	1.98	77.7	1.98
Italy	66.0	2.32	74.5	1.60	76.8	1.81	77.6	2.00
Malta	65.9	4.16	71.7	1.97	75.8	2.03	76.9	2.07
Portugal	59.3	3.02	71.7	2.17	76.0	2.00	76.9	2.00
Spain	63.9	2.55	74.3	2.07	76.8	2.00	77.5	2.00
Yugoslavia	58.1	3.69	70.7	2.07	75.2	1.95	76.6	2.07
Western Europe	67.6	2.36	74.3	1.63	76.8	1.76	77.5	2.00
Austria	65.7	2.09	73.0	1.68	76.3	1.82	77.1	1.96
Belgium	67.5	2.34	73.5	1.65	76.5	1.93	77.3	2.14
France	66.5	2.73	74.5	1.92	76.9	1.85	77.6	2.01
Germany, Federal Republic of	67.5	2.09	73.7	1.40	76.5	1.71	77.3	2.01
Luxembourg	65.9	1.97	70.8	1.54	75.3	1.73	76.7	2.05

TABLE 4 (*continued*)

Region and country	1950-1955		1980-1985		2000-2005		2020-2025	
	e_0	TFR	e_0	TFR	e_0	TFR	e_0	TFR
Netherlands	72.1	3.08	76.0	1.55	77.5	1.55	78.2	1.88
Switzerland	69.2	2.29	76.1	1.53	77.5	1.59	78.1	1.96
Oceania	60.8	3.78	67.9	2.65	72.3	2.26	74.9	2.05
Australia-New Zealand	69.6	3.21	74.8	1.95	77.0	1.89	77.7	1.89
Australia	69.6	3.19	75.0	1.95	77.0	1.89	77.9	1.89
New Zealand	69.6	3.54	73.0	1.94	76.7	1.85	77.5	1.85
Melanesia	39.6	6.22	55.9	5.33	64.7	3.31	69.7	2.41
Fiji	55.2	6.59	68.9	3.50	74.3	2.16	76.1	1.85
Papua New Guinea	35.1	6.21	51.9	5.60	62.2	3.50	68.1	2.47
Other Melanesia	52.1	6.47	67.5	5.94	73.6	3.32	75.7	2.46
Micronesia-Polynesia	53.1	6.68	67.0	5.34	73.4	2.98	75.6	2.37
Micronesia	47.7	5.93	62.7	4.98	72.0	2.93	74.8	2.36
Polynesia	55.9	7.38	69.6	5.60	74.7	3.01	76.3	2.38
Union of Soviet Socialist Republics	64.1	2.82	70.6	2.35	75.4	2.29	76.7	2.25

Source: World Population Prospects. Estimates and Projections as Assessed in 1984 (United Nations publication, Sales No. 86.XIII.3).

2005, according to the United Nations projections, the Club's membership will have risen to 83, with only four members in Africa (Algeria, Mauritius, Réunion and Tunisia), 22 in Latin America, 22 in Asia, three in Melanesia and still 32 in the industrialized countries. One might wonder in those circumstances whether the World Health Organization (WHO) objectives of "Health for all by the year 2000" is attainable, when only half of the countries have a life expectancy of more than 70 years. The world would also be far from attaining the target fixed by the 1974 World Population Conference, held at Bucharest, of an average life expectancy of 74 years by the end of the century. The shortfall will be in the order of 10 years of life expectancy, for the United Nations projections are based on an average life expectancy of 64 years by about 2000 for the entire world. In 2020-2025 the Club's membership will nevertheless have grown even further to 102, including 9 out of 50 African countries, 28 out of 30 Latin American countries (only Haiti and Bolivia will be excluded), 30 out of 40 Asian countries, 3 in Melanesia and the 32 industrialized countries.

The countries that will have more than 100 million inhabitants in 2020-2025 and that do not appear in the Club list include Ethiopia, Nigeria, Zaire, Bangladesh and Pakistan.

In any event, if these projections prove accurate, the world is heading for less inequality with respect to life expectancy, and the extremes will be in Africa (64.5 years) and Western Europe (77.5 years), a gap of 13 years, whereas in 1980-1985 the gap was 24.9 years.

Second observation. Diversity of the third world

The second observation that emerges from consideration of tables 3 and 4 is the extreme diversity of the mortality rates in the third world in comparison with the relative homogeneity of the rich countries. Among the rich countries, Japan has the highest life expectancy, with 76.9 years and Romania the lowest, with 70.2 years, close to that of the USSR (70.6 years) and Hungary (70.3 years). This trend towards homogeneity becomes stronger in the highest levels of life expectancy, as if the leaders formed an increasingly compact squad led by the best who, advancing into the "unknown", is dogged by the next best who are ready to imitate the factors of his success.

Not much further behind comes China, with a life expectancy of 67.8 years, followed by the main countries of Latin America (Argentina, Brazil, Mexico and Uruguay) and, far back, a fairly compact group of 20 countries with the lowest life expectancy, including 17 countries in Africa south of the Sahara, plus only three Asian countries (Afghanistan, Democratic Kampuchea, East Timor) and no Latin American country (table 6).

It is interesting to note that the growing differentiation in the mortality of the countries of the third world is a development of the past 30 years. In the early 1950s the Asian and African countries differed little in their mortality rates: 41.2 years against 37.8 years, a difference of 3.4 years. The difference is greater today, with life expectancy of 59.1 and

TABLE 5. COUNTRIES BELONGING TO THE "OVER-70s CLUB" OF LIFE EXPECTANCY AT BIRTH

1950-1955		*1980-1985*		*2000-2005*		*2020-2025*	
Denmark	(71.0)	Barbados	(72.7)	Mauritius	(72.3)	Mauritius	(74.2)
Iceland	(72.0)	Cuba	(73.4)	Réunion	(74.7)	Réunion	(76.4)
Norway	(72.7)	Guadeloupe	(72.4)	Algeria	(70.3)	Zimbabwe	(70.0)
Sweden	(71.8)	Jamaica	(73.0)	Tunisia	(70.5)	Algeria	(73.4)
Netherlands	(72.1)	Martinique	(73.2)	Barbados	(68.6)	Egypt	(72.7)
		Puerto Rico	(74.0)	Cuba	(76.2)	Libyan Arab Jamahiriya	(72.8)
		Costa Rica	(73.0)	Dominican Republic	(70.2)	Morocco	(72.8)
		Uruguay	(70.3)	Guadeloupe	(76.1)	Tunisia	(73.3)
		Panama	(71.0)	Jamaica	(76.3)	Cape Verde	(74.3)
		Canada	(75.7)	Martinique	(76.4)	All the Latin American countries (except Haiti and Bolivia)	
		United States of America	(74.3)	Puerto Rico	(76.7)		
		Japan	(76.9)	Trinidad and Tobago	(74.1)		
		Hong Kong	(75.5)	Costa Rica	(74.8)		
		Singapore	(71.5)	El Salvador	(72.5)		
		Kuwait	(71.6)	Guatemala	(70.4)	China	(75.7)
				Honduras	(70.7)	Hong Kong	(77.1)
		Cyprus	(74.0)			Korea	(75.9)
		Israel	(74.4)	Mexico	(71.4)	Dem. People's Rep. of Korea	(75.9)
		Australia	(74.8)	Nicaragua	(71.2)	Rep. of Korea	(75.9)
		New Zealand	(73.8)	Panama	(73.9)	Mongolia	(74.1)
		USSR	(70.6)	Argentina	(73.0)	Burma	(72.6)
		All the European countries		Chile	(72.7)	Indonesia	(70.8)
				Uruguay	(72.8)	Malaysia	(75.6)
				Guyana	(73.9)	Philippines	(72.6)
				Suriname	(73.7)	Singapore	(76.9)
				Venezuela	(72.1)	Thailand	(73.1)
				China	(74.0)	Viet Nam	(72.7)
				Hong Kong	(76.6)	India	(71.6)
				Korea	(73.6)	Iran, Islamic Republic of	(72.0)
						Sri Lanka	(76.0)

Dem. People's Rep. of Korea	(73.7)	Bahrain	(76.3)
Rep. of Korea	(73.7)	Iraq	(73.8)
Mongolia	(71.2)	Jordan	(74.6)
Malaysia	(73.3)	Kuwait	(76.9)
Singapore	(75.5)	Lebanon	(75.1)
Sri Lanka	(74.0)	Oman	(71.0)
Bahrain	(74.5)	Qatar	(75.8)
Iraq	(70.9)	Saudi Arabia	(73.9)
Jordan	(71.9)	Syrian Arab Republic	(74.3)
Kuwait	(75.7)	United Arab Emirates	(75.8)
Lebanon	(72.9)	Cyprus	(77.6)
Qatar	(73.7)	Israel	(77.7)
Saudi Arabia	(70.9)	Turkey	(73.8)
Syrian Arab Republic	(71.4)	Fiji	(76.1)
United Arab Emirates	(73.7)	Micronesia	(74.8)
Cyprus	(76.8)	Polynesia	(76.3)
Israel	(77.1)	All the industrialized countries	
Turkey	(70.8)		
Fiji	(74.3)		
Micronesia	(72.0)		
Polynesia	(74.7)		
All the industrialized countries			

Source: World Population Prospects. Estimates and Projections as Assessed in 1984 (United Nations publication, Sales No. 86.XIII.3).

49.4 years respectively, a gap of 9.7 years. The African countries have found improvement in health much more difficult to achieve than the Asian countries and more difficult still than the Latin America countries.

TABLE 6. THE 20 COUNTRIES WITH THE LOWEST LIFE EXPECTANCY AT BIRTH AND THE 20 COUNTRIES WITH THE HIGHEST LIFE EXPECTANCY AT BIRTH (1980-1985)

Country	*Lowest life expectancy*	*Country*	*Highest life expectancy*
Sierra Leone	34.0	Japan	76.9
Gambia	35.0	Iceland	76.8
Afghanistan	37.0	Sweden	76.3
East Timor	39.9	Switzerland	76.1
Guinea	40.2	Norway	76.0
Somalia	40.9	Netherlands	76.0
Ethiopia	40.9	Canada	75.7
Angola	42.0	Hong Kong	75.5
Mali	42.0	Australia	75.0
Niger	42.5	Denmark	74.5
Central African Republic	43.0	Italy	74.5
Chad	43.0	France	74.5
Guinea-Bissau	43.0	Israel	74.4
Senegal	43.3	Spain	74.3
Democratic Kampuchea	43.4	United States	74.3
Equatorial Guinea	44.0	Cyprus	74.0
Mauritania	44.0	Greece	74.0
Benin	44.0	Puerto Rico	74.0
Malawi	45.0	Finland	73.8
Burkina Faso	45.2	New Zealand	73.8

Source: World Population Prospects. Estimates and Projections as Assessed in 1984 (United Nations publication, Sales No. 86.XIII.3).

Where the Asian countries are concerned, at the beginning of the 1950s Bangladesh, China, India, Indonesia and Pakistan had similar levels of life expectancy, roughly 37-40 years; China's lightning advance, gaining 27 years of life expectancy in 30 years, a performance so far unequalled, has left its Asian neighbours far behind. China has achieved a historic record that must be emphasized. Even the rich oil-producing countries of the Middle East, where the population's state of health has made remarkable progress during those 30 years, have not succeeded, with their greater material resources, in surpassing the achievements of the Chinese, whose per capita income, moreover, is modest ($300 according to the World Bank), fairly close to that of many countries south of the Sahara. During the same period, life expectancy in India has increased, from 38.7 to 55.4 years, a substantial increment of 16.7 years, while Pakistan has advanced by 11.1 years and Bangladesh by 11.2 years, hardly more than most of the countries south of the Sahara.

Also in Asia, mention should be made of the rapid progress of the Philippines (14.4 years), Malaysia (13.3 years) and Thailand (15.7 years). All these countries have also experienced sharp falls in fertility, which should be noted, for the evolutions of the two factors are not independent.

On the other hand, the modest progress in Democratic Kampuchea (4 years) and Afghanistan (5.4 years) calls equally for attention. These countries had low life expectancy levels in 1950 and they have remained almost unchanged.

With the exception of China and Japan, advances in life expectancy in Asia are lower than in Latin America, especially in Central America and the Caribbean, where, with Haiti and Nicaragua as exceptions, there are many countries with a life expectancy of over 70 years. In contrast, the performance of Argentina and Uruguay is rather disappointing. By 1950 these two countries had attained a level of health fairly close to that of South Europe, which is hardly surprising since over time these two countries have taken in a large population of immigrants from that part of Europe. Their life expectancy rates, which were about 60-65 years in 1950-1955 and 70 years in 1980-1985, have been overtaken by that of Cuba, which, starting from 58.8 years in 1950, has reached 73.4 years, a figure fairly close to that of Southern Europe, while Argentina and Uruguay have lagged behind.

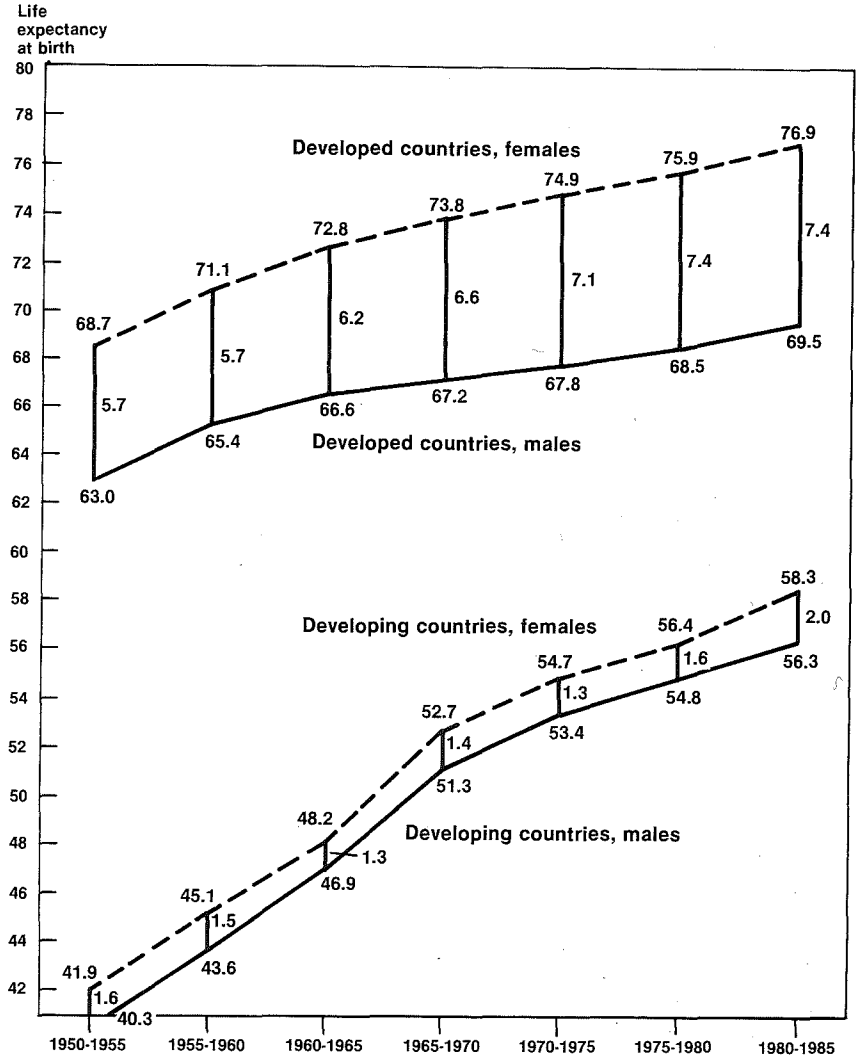
Third observation. Increasing difference between the sexes

The third observation concerns the difference between males and females. Excess male mortality is primarily a feature of the rich countries (see figure I and accompanying data). The difference—an average of 7.4 years—is marked in these countries, implying even larger differences in some of them, and it compares with two years in the developing countries. This all seems to mean that women benefit more than men from the improvement in living conditions, for reasons which some authors attribute to congenital biological strength and others to behavioural factors (less consumption of alcohol and tobacco by women) or environmental factors (more dangerous work activities performed by men). This excess male mortality, or rather this relative advance of women, is increasing both in the industrialized countries and in the developing countries. The difference climbed gradually, from 5.7 years in 1950-1955 to 7.4 years in 1980-1985 in the industrialized countries, and from 1.6 years in 1950-1955 to two years in 1980-1985 in the developing countries. Will it be that the developing countries will have the same mortality differences between the sexes when they reach mortality rates comparable to those of the developed countries today? The United Nations seems to have answered no. In the demographic projections for the developing countries, the United Nations envisages that male life expectancy in 2020-2025 will be 67.5 years and female life expectancy 71.6 years, a difference of 4.1 years, far below that of the developed countries at a time when average life expectancy was of the same order, that is, around 1955-1960.

Fourth observation. The considerable contribution of infant mortality

The fourth observation concerns infant mortality. It is an important one because this mortality has a heavy impact on life expectancy at birth.

Figure I. Life expectancy at birth in developed and developing countries, males and females, 1950-1955 to 1980-1985



Source: World Population Prospects. Estimates and Projections as Assessed in 1984 (United Nations publication, Sales No. 86.XIII.3).

DATA USED IN FIGURE I

	Developed countries		Developing countries		Gaps	
	Males	*Females*	*Males*	*Females*	*Developed countries*	*Developing countries*
1950-1955	63.0	68.7	40.3	41.9	5.7	1.6
1955-1960	65.4	71.1	43.6	45.1	5.7	1.5
1960-1965	66.6	72.8	46.9	48.2	6.2	1.3
1965-1970	67.2	73.8	51.3	52.7	6.6	1.4
1970-1975	67.8	74.9	53.4	54.7	7.1	1.3
1975-1980	68.5	75.9	54.8	56.4	7.4	1.6
1980-1985	69.5	76.9	56.3	58.3	7.4	2.0

Source: World Population Prospects. Estimates and Projections as Assessed in 1984 (United Nations publication, Sales No. 86.XIII.3).

It is calculated that for a life expectancy of 45 years, common in the third world, the infant mortality rate is in the order of 140 per 1,000 births and accounts for about a quarter of deaths. *

Rates above 100 per thousand are found in almost all the African countries, with rare exceptions, and in the countries of South Asia. Rates even higher than 175 per thousand are found in Sierra Leone, Mali, East Timor and Afghanistan. Rates between 150 and 175 per thousand are found in the Gambia, Ethiopia, Malawi, Mozambique, Guinea, Somalia and Democratic Kampuchea. In seven countries, all in Africa south of the Sahara, the rate is between 140 and 150 per thousand (see table 7).

These rates fluctuate considerably over time, depending on the caprices of the weather, drought and food supply, and in disaster situations it is difficult to measure the scale of the phenomenon. This is currently the case in Ethiopia and the Sudan.

It has been found that third-world infant mortality depends less on family income than on an entire range of socio-cultural and environmental factors, with the mother's education level occupying first place. The best educated women are less fatalistic and more capable of breaking free of traditional attitudes about disease and using simple measures of hygiene for diseases that are benign in the rich countries, such as measles and diarrhoea, but that ravage the poor countries. According to J. Caldwell,[2] the mother's education is not a simple substitution variation for a set of other variables with which it is correlated, but produces its own impact. The United Nations calculates that an additional year of maternal education reduces the infant mortality rate by an average of 3.4 per cent, so that among populations with 10 years of maternal schooling the infant mortality rate is 34 per cent lower than it would be with no education.[3]

H. Behm has analysed the differences in infant mortality for 12 countries of Latin America in terms of maternal education.[4] He has shown that the children of illiterate mothers have a risk 3.5 to 5 times greater than

* In the countries in which the age structure gives a total fertility rate of 6 and a life expectancy at birth of 45 years.

TABLE 7. INFANT MORTALITY IN 1980-1985
(*rate per thousand*)

Regions and subregions		*0-29*		*30-100*		*101-150*		*151-175*		*176 and over*	
East Africa	120	Mauritius	28	Comoros	88	Burundi	124	Ethiopia	155		
		Réunion	13	Kenya	80	Rwanda	132	Malawi	163		
				Madagascar	67	Uganda	112	Mozambique	153		
				Zambia	88	United Republic of Tanzania	115	Somalia	155		
Central Africa	117			Congo	81	Angola	149				
						Cameroon	103				
						Central African Republic	142				
						Chad	143				
						Equatorial Guinea	137				
						Gabon	112				
						Zaire	107				
North Africa	100			Algeria	88	Sudan	118				
				Egypt	100						
				Libyan Arab Jamarihiya	97						
				Morocco	97						
				Tunisia	85						
Southern Africa	87			Botswana	76	Lesotho	111				
				South Africa	83	Namibia	116				
						Swaziland	129				
West Africa	123			Cape Verde	75	Benin	120	Gambia	174	Mali	180
				Ghana	98	Côte d'Ivoire	110	Guinea	159	Sierra Leone	180
						Guinea-Bissau	143				
						Liberia	132				
						Mauritania	137				
						Niger	146				
						Nigeria	114				
						Senegal	142				
						Togo	102				
						Burkina Faso	150				
Caribbean	65	Barbados	14	Dominican Rep.	75	Haíti	128				
		Cuba	17								
		Guadeloupe	14								
		Jamaica	21								
		Martinique	14								
		Puerto Rico	17								
		Trinidad and Tobago	24								
Central America	57	Costa Rica	20	El Salvador	70						
		Panama	26	Guatemala	70						
				Honduras	82						
				Mexico	53						
				Nicaragua	76						
Temperate South America	32	Chile	23	Argentina	36						
				Uruguay	30						
Tropical South America	69			Brazil	71	Bolivia	124				
				Colombia	50						
				Ecuador	70						
				Guyana	36						
				Paraguay	45						
				Peru	99						
				Suriname	36						
				Venezuela	39						
North America	11	Canada	9								
		United States	11								
East Asia	36	Japan	6	China	39						
		Hong Kong	10	Korea	30						
				Dem. People's Rep. of Korea	30						
				Rep. of Korea	30						

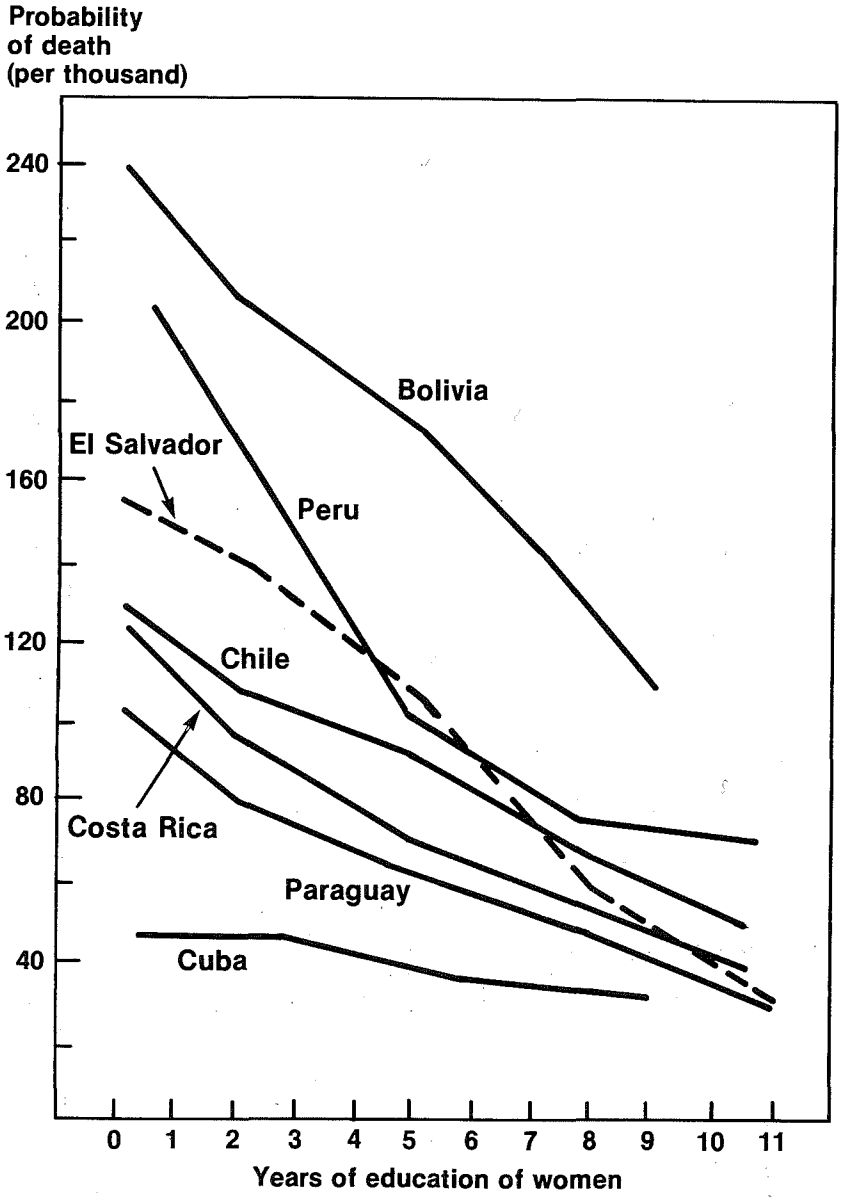
TABLE 7 (*continued*)

Regions and subregions	*0-29*		*30-100*		*101-150*		*151-175*		*176 and over*	
			Mongolia	53	Lao People's Dem. Rep.	122	Democratic Kampuchea	160		
South Asia	115		Sri Lanka	39	Bangladesh	128			Afghanistan	194
					Bhutan	139				
					India	110				
					Iran (Islamic Rep. of)	115				
					Nepal	139				
					Pakistan	120				
South-Eastern Asia	73	Singapore	10	Burma	70				East Timor	183
				Indonesia	84					
				Malaysia	30					
				Philippines	51					
				Thailand	48					
				Viet Nam	76					
Western Asia	81	Kuwait	23	Iraq	77	Dem. Yemen	135			
		Cyprus	17	Jordan	54	Oman	117			
		Israel	14	Lebanon	48	Yemen	135			
				Qatar	38					
				Saudi Arabia	85					
				Syrian Arab Republic	59					
				United Arab Emirates	38					
				Turkey	92					
				Bahrain	32					
Eastern Europe	19	Bulgaria	18							
		Czechoslovakia	14							
		German Democratic Republic	11							
		Hungary	20							
		Poland	20							
		Romania	26							
Northern Europe	10	Denmark	8							
		Finland	6							
		Iceland	6							
		Ireland	10							
		Norway	8							
		Sweden	7							
		United Kingdom	10							
Southern Europe	17	Greece	16	Albania	45					
		Italy	13	Yugoslavia	30					
		Malta	13							
		Portugal	20							
		Spain	10							
Western Europe	10	Austria	12							
		Belgium	11							
		France	9							
		Germany, Fed. Rep. of	11							
		Luxembourg	9							
		Netherlands	8							
		Switzerland	8							
Oceania	31	Australia	11	Fiji	31					
		New Zealand	12	Papua New Guinea	74					
				Micronesia	36					
				Polynesia	30					
USSR	25	USSR	25							

Source: World Population Prospects. Estimates and Projections as Assessed in 1984 (United Nations publication, Sales No. 86.XIII.3).

the children of mothers with 10 years or more of schooling. As figure II shows, the range of infant mortality rates is much wider in the countries with high mortality rates than in those with low mortality. For example,

Figure II. Mortality under two years of age, by number of years of education of the mother, Latin American countries, 1966-1971



Source: Hugo Behm, "Socio-economic determinants of mortality in Latin America", *Population Bulletin of the United Nations*, No. 13, 1980 (United Nations publication, Sales No. E.81.XIII.4), pp. 1-15.

in Cuba, where the infant mortality rate is the lowest of the 12 countries, the phenomenon of differential infant mortality is hardly significant.

The infant mortality rate is also influenced by other socio-economic factors, such as the father's education, urban or rural residence, with the towns usually having better sanitation facilities than the countryside, and housing conditions (running water, lavatories, electricity etc.), but none of these factors has such a strong effect on infant mortality as maternal education. The paramedical training of midwives and the existence of a public health inspectorate are other factors that improve child health.

These socio-economic, cultural and environmental factors work differently depending on the mother's age (infant mortality is higher with very young and very old mothers), order of birth (infant mortality is higher among the first born and older children, especially those over the age of seven), and nutritional conditions, especially breast-feeding.[5] Malnutrition weakens the child's organism and makes it more vulnerable to infectious agents. But breast-feeding provides the child with a degree of protection, guarantees him a minimum of sustenance and protects him against water contamination. Thus, weaning, which often takes place in the third world when the child is two or three years old (see table 8) but is tending to occur earlier, exposes the child to the same food as the adults, deprives him of some protection and increases his risk of mortality. Infant mortality is not therefore a sufficient factor for determining the conditions of child survival, and the analysis must also take into account mortality at ages one to four. It is found that in Africa, especially West Africa, the mortality rate at ages one to four is higher than in the other populations with generally comparable mortality. In Senegal, the mortality rate at ages one to four is higher than the infant mortality.

There is little doubt that in the countries in which the infant mortality rate exceeds 100 per thousand (see table 7) the early-age mortality (from 0 to 4 years) is determined by the combined effect of infections and parasitic, diarrhoeal and respiratory diseases, on the one hand, and by nutritional deficiencies on the other: nutritional deficiencies weaken the child's organism and make it more vulnerable to infections and parasitic, diarrhoeal and respiratory diseases.

Fifth observation. Impact of socio-economic factors on mortality

An initial idea of the socio-economic factors of mortality can be obtained by considering the connection between a country's per capita income and its life expectancy at birth. Figure III (see also accompanying data) shows that there is indeed a connection: the higher the per capita income (a logarithmic scale has been used here, but that in no way affects the conclusions), the higher the life expectancy. Figure III shows only the countries of the third world, but the relationship emerges with even greater clarity when the industrialized countries are included. There is a concentration of points at low levels of income and life expectancy, representing mainly countries south of the Sahara and a few Asian countries.

The relationship is fairly clear but it does have several "aberrant" features, which can usefully be indicated and briefly discussed. First of

TABLE 8. AVERAGE, MEDIAN, FIRST AND THIRD QUARTILES OF DURATION OF BREAST-FEEDING

Country	*Average*	*Median*	*First quartile*	*Third quartile*
Africa				
Benin	21.2	19.9	15.3	27.1
Cameroon	19.1	18.3	14.4	24.6
Egypt	18.8	17.8	11.7	23.8
Ghana	19.2	17.8	13.8	23.7
Côte d'Ivoire	19.3	20.2	13.9	24.5
Kenya	17.9	16.6	12.7	22.4
Lesotho	20.9	21.0	18.4	26.1
Mauritania	17.0	17.7	15.0	20.7
Morocco	15.6	16.6	9.6	21.5
Senegal	19.9	19.7	17.5	23.3
Sudan	17.0	17.1	12.8	20.9
Tunisia	14.9	15.8	6.7	19.8
Average	18.4			
Americas				
Colombia	9.7	7.4	3.1	14.5
Costa Rica	5.2	1.9	0.5	9.2
Dominican Republic	9.0	7.7	3.1	13.4
Ecuador	13.1	12.5	7.0	18.2
Guyana	7.0	4.0	1.6	9.9
Haiti	16.9	18.6	11.7	20.8
Jamaica	8.8	9.1	2.9	12.0
Mexico	9.6	7.9	1.6	16.0
Panama	7.6	3.8	1.2	13.5
Paraguay	11.6	12.1	6.9	16.5
Peru	14.2	13.8	6.2	20.9
Trinidad and Tobago	6.1	3.4	1.1	7.9
Venezuela	7.6	4.1	1.3	12.4
Average	9.7			
Asia and Oceania				
Bangladesh	33.5	32.1	23.3	43.5
Fiji	9.7	9.2	2.1	14.2
Indonesia	26.3	26.0	17.0	34.3
Jordan	11.8	10.7	4.8	18.1
Republic of Korea	17.0	17.3	9.9	23.4
Malaysia	5.8	2.7	0.8	10.2
Nepal	30.5	26.8	21.0	37.9
Pakistan	21.9	20.8	16.5	26.9
Philippines	13.9	14.1	4.6	19.4
Sri Lanka	22.3	21.7	12.3	30.0
Syrian Arab Republic	11.7	10.2	5.5	17.8
Thailand	19.9	19.4	10.8	28.4
Yemen	12.9	9.4	5.2	21.7
Average	18.2			

Source: "Breast-feeding and related aspects of post-partum reproductive behaviour" (IESA/P/WP/90).

all, as might be expected, there is the case of China. The point for China is situated at the intersection of a per capita income of $300 and a life expectancy of 67.8 years. It is necessary to move up the graph to the area of $2,000 per capita income to find a life expectancy of that level. What-

Figure III. Ratio of per capita national income to life expectancy at birth in the third world

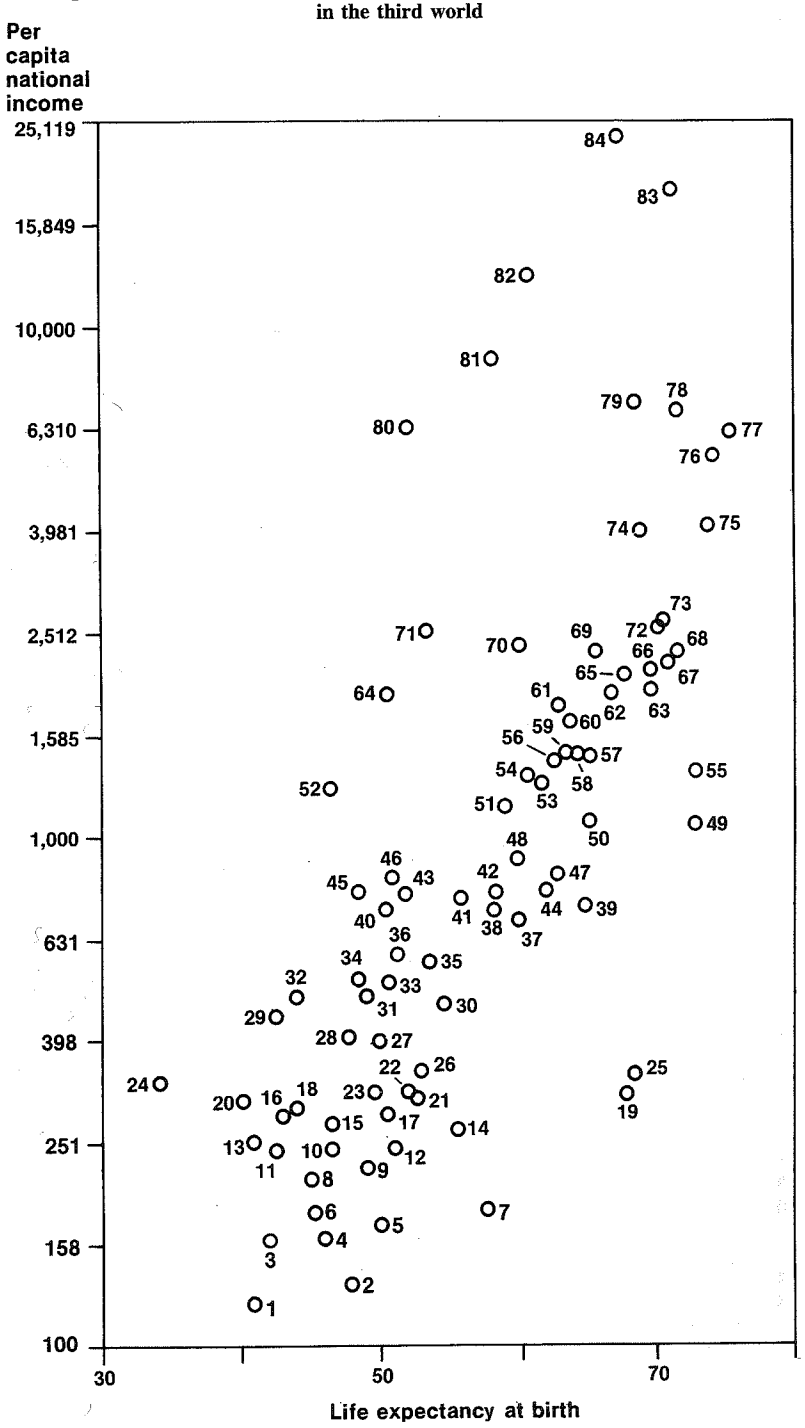


Figure III (*continued*)

Number	Country	Number	Country	Number	Country
1.	Ethiopia	29.	Senegal	60.	Jordan
2.	Bangladesh	30.	Lesotho	61.	Syrian Arab Republic
3.	Mali	31.	Liberia	62.	Malaysia
4.	Nepal	32.	Mauritania	63.	Chile
5.	Zaire	33.	Bolivia	64.	Brazil
6.	Burkina Faso	34.	Democratic Yemen	65.	Republic of Korea
7.	Burma	35.	Indonesia	66.	Argentina
8.	Malawi	36.	Zambia	67.	Panama
9.	Uganda	37.	Honduras	68.	Portugal
10.	Burundi	38.	Egypt	69.	Mexico
11.	Niger	39.	El Salvador	70.	Algeria
12.	United Republic of Tanzania	40.	Côte d'Ivoire	71.	South Africa
13.	Somalia	41.	Zimbabwe	72.	Uruguay
14.	India	42.	Morocco	73.	Yugoslavia
15.	Rwanda	43.	Papua New Guinea	74.	Venezuela
16.	Central African Republic	44.	Philippines	75.	Greece
17.	Togo	45.	Nigeria	76.	Israel
18.	Benin	46.	Cameroon	77.	Hong Kong
19.	China	47.	Thailand	78.	Singapore
20.	Guinea	48.	Nicaragua	79.	Trinidad and Tobago
21.	Haiti	49.	Costa Rica	80.	Oman
22.	Ghana	50.	Peru	81.	Libyan Arab Jamahiriya
23.	Madagascar	51.	Guatemala	82.	Saudi Arabia
24.	Sierra Leone	52.	Congo	83.	Kuwait
25.	Sri Lanka	53.	Turkey	84.	United Arab Emirates
26.	Kenya	54.	Tunisia		
27.	Pakistan	55.	Jamaica		
28.	Sudan	56.	Dominican Republic		
		57.	Paraguay		
		58.	Ecuador		
		59.	Columbia		

DATA USED IN FIGURES III, V AND VI

Country	Per capita national income in 1983 (dollars)	Life expectancy at birth in 1980-1985	Total fertility rate in 1980-1985
1. Ethiopia	120	40.9	6.70
2. Bangladesh	130	47.8	6.15
3. Mali	160	42.0	6.70
4. Nepal	160	45.9	6.25
5. Zaire	170	50.0	6.09
6. Burkina Faso	180	45.2	6.50
7. Burma	180	57.5	4.10
8. Malawi	210	45.0	7.00
9. Uganda	220	49.0	6.90
10. Burundi	240	46.5	6.44
11. Niger	240	42.5	7.10
12. United Republic of Tanzania	240	51.0	7.10
13. Somalia	250	40.9	6.60
14. India	260	55.4	4.30
15. Rwanda	270	46.5	7.51
16. Central African Republic	280	43.0	5.89
17. Togo	280	50.5	6.09

DATA USED IN FIGURES III, V AND VI (*continued*)

Country	Per capita national income in 1983 (dollars)	Life expectancy at birth in 1980-1985	Total fertility rate in 1980-1985
18. Benin	290	44.0	7.00
19. China	300	67.8	2.36
20. Guinea	300	40.2	6.19
21. Haiti	300	52.7	5.74
22. Ghana	310	52.0	6.50
23. Madagascar	310	49.6	6.09
24. Sierra Leone	330	34.0	6.13
25. Sri Lanka	330	68.4	3.38
26. Kenya	340	52.9	8.12
27. Pakistan	390	50.0	5.84
28. Sudan	400	47.7	6.58
29. Senegal	440	42.5	7.10
30. Lesotho	460	54.5	6.50
31. Liberia	480	49.0	6.90
32. Mauritania	480	44.0	6.90
33. Bolivia	510	50.7	6.25
34. Democratic Yemen	520	48.4	6.76
35. Indonesia	580	53.5	4.10
36. Zambia	510	51.3	6.76
37. Honduras	670	59.9	6.50
38. Egypt	700	58.1	4.82
39. El Salvador	710	64.8	3.56
40. Côte d'Ivoire	710	50.5	6.70
41. Zimbabwe	740	55.8	6.60
42. Morocco	760	58.3	5.13
43. Papua New Guinea	760	51.9	5.60
44. Philippines	760	61.9	4.41
45. Nigeria	770	48.5	7.10
46. Cameroon	820	50.9	5.79
47. Thailand	820	62.7	3.52
48. Nicaragua	880	59.8	5.94
49. Costa Rica	1 020	73.0	3.50
50. Peru	1 040	65.1	4.85
51. Guatemala	1 120	59.0	6.12
52. Congo	1 230	46.5	5.99
53. Turkey	1 240	61.6	3.96
54. Tunisia	1 290	60.6	4.82
55. Jamaica	1 300	73.0	3.37
56. Dominican Republic	1 370	62.6	4.18
57. Paraguay	1 410	65.1	4.85
58. Ecuador	1 420	64.3	5.00
59. Colombia	1 430	63.4	3.81
60. Jordan	1 640	63.7	7.38
61. Syrian Arab Republic	1 760	62.9	7.17
62. Malaysia	1 860	66.8	3.91
63. Chile	1 870	69.7	2.59
64. Brazil	1 880	50.7	6.25
65. Republic of Korea	2 010	67.7	3.04
66. Argentina	2 070	69.7	3.38
67. Panama	2 120	71.0	3.46
68. Portugal	2 230	71.7	2.17
69. Mexico	2 240	65.7	4.61
70. Algeria	2 320	60.1	6.66
71. South Africa	2 490	53.5	5.07

DATA USED IN FIGURES III, V AND VI (*continued*)

Country	*Per capita national income in 1983 (dollars)*	*Life expectancy at birth in 1980-1985*	*Total fertility rate in 1980-1985*
72. Uruguay	2 490	70.3	2.76
73. Yugoslavia	2 570	70.7	2.07
74. Venezuela	3 840	69.0	4.10
75. Greece	3 920	74.0	2.15
76. Israel	5 370	74.4	3.09
77. Hong Kong	6 000	75.3	1.91
78. Singapore	6 620	71.8	1.69
79. Trinidad and Tobago	6 850	68.7	2.88
80. Oman	6 250	52.3	7.07
81. Libyan Arab Jamahiriya	8 480	58.3	7.17
82. Saudi Arabia	12 230	60.9	7.07
83. Kuwait	17 880	71.6	6.15
84. United Arab Emirates	22 870	67.6	5.94

Source: Per capita national income: World Bank; life expectancy and fertility rate: *World Population Prospects. Estimates and Projections as Assessed in 1984* (United Nations publication, Sales No. 86.XIII.3).

ever the difficulties of assessing China's per capita income, its point on the graph is so eccentric that its situation would in any event seem expectional. Another aberrant feature, similar to the case of China, is that of Sri Lanka (per capita income of $330 and life expectancy of 68.4 years). Cuba's per capita income is not known (the World Bank does not give an assessment), but there is every reason for thinking that its point ought to be situated in the area of low income, yet Cuba has exceptionally high life expectancy. Costa Rica also has a relatively high life expectancy, in view of its per capita income (per capita income of $1,020 and life expectancy of 73 years). Another series of aberrant points represent the oil-producing countries of the third world, in particular those of the Middle East. Their levels of life expectancy are average or high, having made considerable progress during the past two decades, but they remain out of step with their per capita incomes. Their relatively new wealth is an omen of further rapid advances in life expectancy; this hypothesis has in fact been used in the United Nations demographic projections.

We should note in passing that the high mortality rate in third-world countries has many economic effects, particularly on the productivity of labour, and even on the labour supply. For example, it is calculated that in countries with a life expectancy at birth of about 40 years, some 15 years of active life per worker are lost owing to mortality, whereas in countries with a life expectancy of about 70 years, the loss is only two or three years—the case in the industrialized countries. In fact, the effect of different mortality rates should be taken into account for the entire cycle from birth to death and passing through active life and retirement. Little research has been done in this field.

Sixth observation. Health strategies must be adapted to development styles

One of the main problems in combating morbidity and mortality in the third world is knowing what contribution should be required in this struggle from the health system as such and what should come from development efforts, for a health policy must be viewed in terms not only of health services but also of development policies. For certain diseases such as malaria, tuberculosis, smallpox and measles, improvement of the health system plays a decisive role, with relatively cheap interventions, whereas in the case of other diseases such as diarrhoea and certain infectious diseases, it is economic and social change that is decisive, acting through better nutrition and water-supply and drainage systems, which are relatively costly, and especially through improved education. But it is sometimes difficult to make the distinction. The new oral-rehydration treatment, for example, is sometimes administered to children suffering from various diarrhoeal infections in the form of an aqueous solution of sodium chloride, bicarbonate of soda, potassium chloride and glucose; the cost is low and this is an excellent example of inexpensive innovation which can help to produce a sharp decline in infant mortality. However, the fundamental answer remains better nutrition and investments for improved water quality.

Health is not, therefore, the exclusive concern of the health system but also, especially in indirect ways, of development styles, as WHO has always said. Drinking water, proper drainage and good health education—especially of women, as we saw in connection with infant and early-age mortality—can save more human lives in the third world than medicine itself. Experience shows that low infant mortality rates can be attained in societies with high education levels by means of fairly inexpensive health services, even when incomes are not high. This is demonstrated very well by the achievements of China, Sri Lanka and Costa Rica, which are all represented by aberrant points in figure III. Other examples are Kerala State in India, which is fairly poor but has quite a high education level and an advanced social policy, and Cuba, where the life expectancy exceeds that of many European countries with either socialist or market economies, apparently as a result of the education effort. In Sri Lanka, a fully subsidized food-rationing plan has provided for the needs of the poorest.

In these different third-world countries, one of the main goals of health policy is to ensure the broadest possible cover of needs rather than to concentrate the available resources on urban areas and certain social classes. They have introduced techniques that are simpler than those in use in the developed countries and capable of saving more human lives, being adapted to the economic, social and cultural circumstances of the population. Use has been made, in keeping with the philosophy established by the international health conference at Alma Ata in 1978, of so-called "primary health care" and of techniques and skills adapted to the epidemiological conditions and involving teams of doctors and auxiliaries

who are not necessarily trained according to the technological canons current in the rich countries, but who are capable of making the most obvious diagnoses, carrying out vaccinations, providing nutritional education and taking action to improve the water quality. The team is "light" and mobile, less centred on the urban hospital and concerned as much with cure. It is a fact that in the poor countries the share of the national income allocated to health cannot be large—in the order of $5 to $10 per year per inhabitant, as against $550 in the rich countries. Different strategies for different means.

C. Fertility

For the measurement of fertility, the present report uses what is called the total fertility rate. This rate is obtained by simple addition of the fertility rates by age of mothers during a given year. It is a better measure of fertility than the gross birth rate, which is influenced by the population's age structure, and its meaning is plain. A total fertility rate of 6, for example, means that women will have had six births by the end of their reproductive life if the different fertility rates by age remain unchanged (see table 9).

In the mortality conditions of the industrialized countries (life expectancy at birth of 73 years), the total fertility rate must be at least 2.1 for generations to be fully renewed. The difference between 2 and 2.1 represents the mortality of mothers before the average child-bearing age of 27-28 years. In the mortality conditions of the developing countries (average life expectancy of 55 years), this rate must be at least 2.5 to ensure the full renewal of generations.

First observation. Large differences between rich and poor

As table 3 shows, the total fertility rate was, on average, a little under 2 in the industrialized countries in 1980-1985 and a little over 4 on average in the developing countries. The drop between 1970-1975 and 1980-1985 was about 9.2 per cent in the first group and 24.8 per cent in the second. It is true that, with the elimination of China, which has considerable weight in the third world, the drop is smaller in the second group, being only 15 per cent.

Throughout recent years, the decline has been speeding up in both industrialized and third-world countries, and the overall gap between these two groups has therefore remained almost constant.

The decline in the rich countries, although small in comparison with that in the developing countries, has penetrated what had long been considered a floor, that is, the rate that ensures generational renewal, and it is unlikely that it will go much further, whereas the third world is still far from this floor, which, moreover, ought to sink steadily from 2.5 to 2.1 as mortality declines.

Comparison of the curves for the main subregions of the world since 1950-1955, extended by projections up to 2020-2025 (see figure IV),

Table 9. Total fertility rate by region and country (1980-1985)

Region	*0-1.99*	*2-2.99*	*3-4.49*	*4.5-5.99*	*6 and over*
East Africa	6.82	Mauritius 2.76 Réunion 2.23			Burundi 6.44 Comoros 6.29 Ethiopia 6.10 Kenya 8.12 Madagascar 6.09 Malawi 7.00 Mozambique 6.09 Rwanda 7.51 Somalia 6.60 Uganda 6.90 United Republic of Tanzania 7.10 Zambia 6.76 Zimbabwe 6.60
Central Africa	6.02			Central African Republic 5.89 Chad 5.99 Congo 5.99 Equatorial Guinea 5.66 Cameroon 5.79	Angola 6.39 Zaire 6.09
North Africa	5.55				Egypt 4.82 Morocco 5.13 Tunisia 4.82	Algeria 6.66 Libyan Arab Jamahiriya 7.17 Sudan 6.58
Southern Africa	5.21			Lesotho 5.79	Botswana 6.50 South Africa 5.07 Swaziland 6.50

TABLE 9 (*continued*)

Region		0-1.99		2-2.99		3-4.49		4.5-5.99		6 and over	
West Africa	6.86							Cape Verde	4.77	Benin	7.00
								Guinea-Bissau	5.38	Gambia	6.39
										Ghana	6.50
										Guinea	6.19
										Côte d'Ivoire	6.70
										Liberia	6.90
										Mali	6.70
										Mauritania	6.90
										Niger	7.10
										Senegal	6.50
										Sierra Leone	6.13
										Togo	6.09
										Burkina Faso	6.50
										Nigeria	7.10
Caribbean	3.34	Barbados	1.94	Guadeloupe	2.55	Dominican Republic	4.18	Haiti	5.74		
		Cuba	1.97	Martinique	2.14	Jamaica	3.37				
				Puerto Rico	2.54						
				Trinidad and Tobago	2.88						
Central America	4.83					Costa Rica	3.50	Mexico	4.61	Guatemala	6.12
						El Salvador	3.56	Nicaragua	5.94	Honduras	6.50
						Panama	3.46				
Temperate South America	3.11			Chile	2.59	Argentina	3.38				
				Uruguay	2.76						
Tropical South America	4.08					Brazil	3.81	Ecuador	5.00	Bolivia	6.25
						Colombia	3.98	Paraguay	4.85		
						Guyana	3.26	Peru	5.00		
						Suriname	3.59	Venezuela	4.10		

North America	1.83	Canada	1.71								
		United States	1.85								
East Asia	3.54	Japan	1.79	China	2.36	Democratic Rep. of Korea	4.02	Mongolia	5.12		
		Hong Kong	1.91	Rep. of Korea	2.60						
South Asia	4.72					India	4.30	Bhutan	5.53	Afghanistan	6.90
						Sri Lanka	3.38	Iran (Islamic Republic of)	5.64	Bangladesh	6.15
								Pakistan	5.84	Nepal	6.25
South-eastern Asia	4.11	Singapore	1.69			Burma	4.10	Democratic Kampuchea	5.12		
						Indonesia	4.10	East Timor	5.84		
						Malaysia	3.91	Laos	5.84		
						Philippines	4.41				
						Thailand	3.52				
						Viet Nam	4.30				
Western Asia	5.22			Cyprus	2.43	Lebanon	3.79	Bahrain	4.63	Democ. Yemen	6.76
						Israel	3.09	United Arab Emirates	5.94	Iraq	6.66
						Turkey	3.96			Jordan	7.38
										Kuwait	6.15
										Oman	7.07
										Qatar	6.76
										Saudi Arabia	7.07
										Syrian Arab Republic	7.17
										Yemen	6.97
Eastern Europe	2.18	German Dem. Republic	1.81	Bulgaria	2.25						
		Hungary	1.86	Czechoslovakia	2.11						
				Poland	2.26						
				Romania	2.80						
Northern Europe	1.86	Denmark	1.47	Iceland	2.40	Ireland	3.09				
		Finland	1.67								
		Norway	1.71								

TABLE 9 (*continued*)

Region	0-1.99		2-2.99		3-4.49		4.5-5.99		6 and over	
Northern Europe (*continued*)		Sweden	1.64							
		United Kingdom	1.90							
Southern Europe	1.93	Italy	1.60	Greece	2.15	Albania	3.60			
		Malta	1.97	Portugal	2.17					
				Spain	2.07					
				Yugoslavia	2.07					
Western Europe	1.63	Austria	1.68							
		Belgium	1.65							
		France	1.97							
		Germany, Fed. Rep. of	1.40							
		Luxembourg	1.54							
		Netherlands	1.55							
		Switzerland	1.53							
Oceania	2.65	Australia	1.95			Fiji	3.50	Papua New Guinea	5.60	
		New Zealand	1.94					Micronesia	4.98	
								Polynesia	5.60	
USSR	2.35			USSR	2.35					

Source: World Population Prospects. Estimates and Projections as Assessed in 1984 (United Nations publication, Sales No. 86.XIII.3).

reveals a striking and almost synchronous movement of the curves for the industrialized countries, which all converge towards a fairly narrow range around a rate of two births per woman in 2020-2025, the United Nations having assumed in the "medium" variant of the projections a slight upturn in the curves at the beginning of the next century.

Most of the curves for third-world countries are falling and the fall is often fast. China has the most spectacular drop, with a decline in the total fertility rate of 50.2 per cent in only 10 years, a shift that took at least a century in the majority of the industrialized countries. But the curve turns upwards in some third-world countries, and there is considerable variety in the rates of decline.

The curves for the period 1950-2020 show that the gap with the third world is widest in our own era. Between West Africa, with an average total fertility rate of 6.86 in 1980-1985, and East Asia, with a rate of 2.34, the ratio is almost one to three, whereas in 1950-1955 the rates were closer (6.62 and 5.68 respectively). The sharpest fall—without precedent, as already indicated—is in East Asia, where China brings all its weight to bear.

In historical terms, it is thus in the present era that the fertility differences in the third world are most marked and it is not until 2020-2025 that the gaps between these countries ought to close to any significant extent. Of course, all this is pure conjecture and should not be taken too literally, despite the credibility of the United Nations projections, which, moreover, are similar to those of the World Bank and the United States Census Bureau.

Second observation. Diversity of paths in the third world

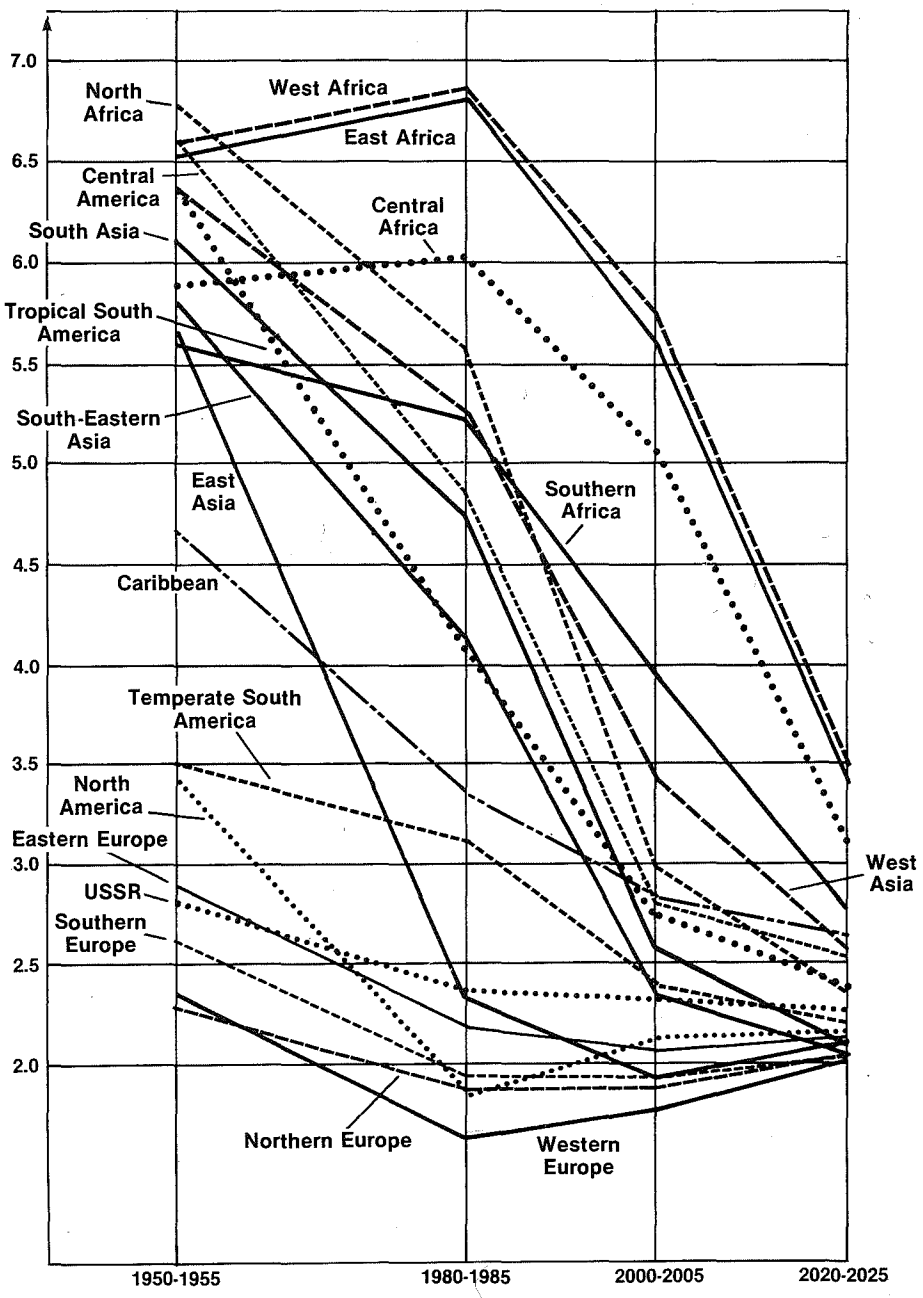
The fertility curves are thus tending to decline generally in the third world. However, as in the case of mortality, there are exceptions that should be noted.

First, as already pointed out, the increased fertility up to 1980-1985 of three African subregions, West, Central and East Africa, seems to be continuing at present.

Thus, it will not actually be until after the end of this century that Africa south of the Sahara will show a substantial drop in its fertility rate. The total fertility rate for West, Central and East Africa will fall to about 3.5 in 2020-2025, a decline which, without being as dizzying as China's, will be no less dramatic. The underlying hypothesis, therefore, is that in these three subregions sociological, economic, cultural and political changes encouraging reduced fertility will not emerge before the beginning of the next century, but that then they will be sufficiently powerful to cause a decline in fertility of about 40 per cent in 20 years. Of course, this is a fairly risky hypothesis by the United Nations, but it is fairly plausible. The countries of tropical South America as a whole did almost as much between 1965 and 1985.

Another special feature of figure IV concerns the countries of Western Asia. The decline, in comparison with other countries, not only

Figure IV. Total fertility rates of main subregions, 1950-1955 to 2020-2025[a]



Source: World Population Prospects. Estimates and Projections as Assessed in 1984 (United Nations publication, Sales No. 86.XIII.3).

[a] Data taken from table 3 above.

of Asia but also of much of the third world, has been slow during the past two decades despite the exceptional oil earnings. If the Arab countries are singled out, and they are in fact the majority, it can be seen that the fall has actually been insignificant, from 6.94 in 1950-1955 to 6.72 in 1980-1985, which is similar to the rates for Africa south of the Sahara.

Latin America's fertility curves generally follow a sharply descending path; the decline seems to have begun in 1965, led by the countries of Central America and the Caribbean. The only exceptions are Argentina and Uruguay, which, as we noted, have also had a slower increase in life expectancy at birth. It is true that these two countries already had fairly low fertility rates in 1950-1955 (about 3). They have now been joined by Chile, where the rate has fallen below 3 from a level of about 5 in 1950. Cuba's rate has fallen, like those of Western Europe, below the rate of generational renewal, being 1.97.

On the other hand, some Latin American countries, namely, Bolivia, Honduras and Guatemala, still have fertility rates of 6 or even higher.

Apart from China, which must definitely be viewed as an exception in the third world from many standpoints, other Asian countries (Indonesia, the Philippines, Malaysia, Thailand and Sri Lanka) have rapidly declining fertility rates, owing in large part, in addition to favourable cultural and political conditions, to birth control programmes encouraged by the Governments and carried out fairly efficiently.

India has shown a slow decline in its fertility rate. In the post-war period, from the time of the formulation of the first five-year plan, which stated India's demographic problem in its preamble, the Government has been in favour of a decline in the fertility rate. The rate had fallen to 4.3 by 1980-1985, well below the rates of Bangladesh and Pakistan, which were still about 6. India is expected to have a rate of about 2.25 at the beginning of the next century, that is, similar to the rate of Western Europe in about 1950.

Third observation. Fertility and mortality go together

Just as there was a spectacular fall in mortality in China, Cuba, Costa Rica, Sri Lanka and, to a lesser extent, the Philippines, the Republic of Korea, Malaysia and Thailand, so these countries show sharp declines in fertility. This connection can be seen in figure V, which shows the total fertility rate and the life expectancy at birth of the countries of the third world.

This connection can apparently be explained as follows. The countries that made the greatest efforts in the implementation of the primary health care policy, often in fact anticipating and inspiring the conclusions of the international health conference at Alma Ata, also seem to be the countries that successfully carried out a fertility-reduction policy; these countries do not head the list of per capita incomes, thus showing clearly that high fertility and high mortality are two aspects of the same process and that many factors that influence fertility also come into play with respect to mortality, factors that are social rather than economic.

Figure V. Ratio of life expectancy at birth to total fertility rate in the third world

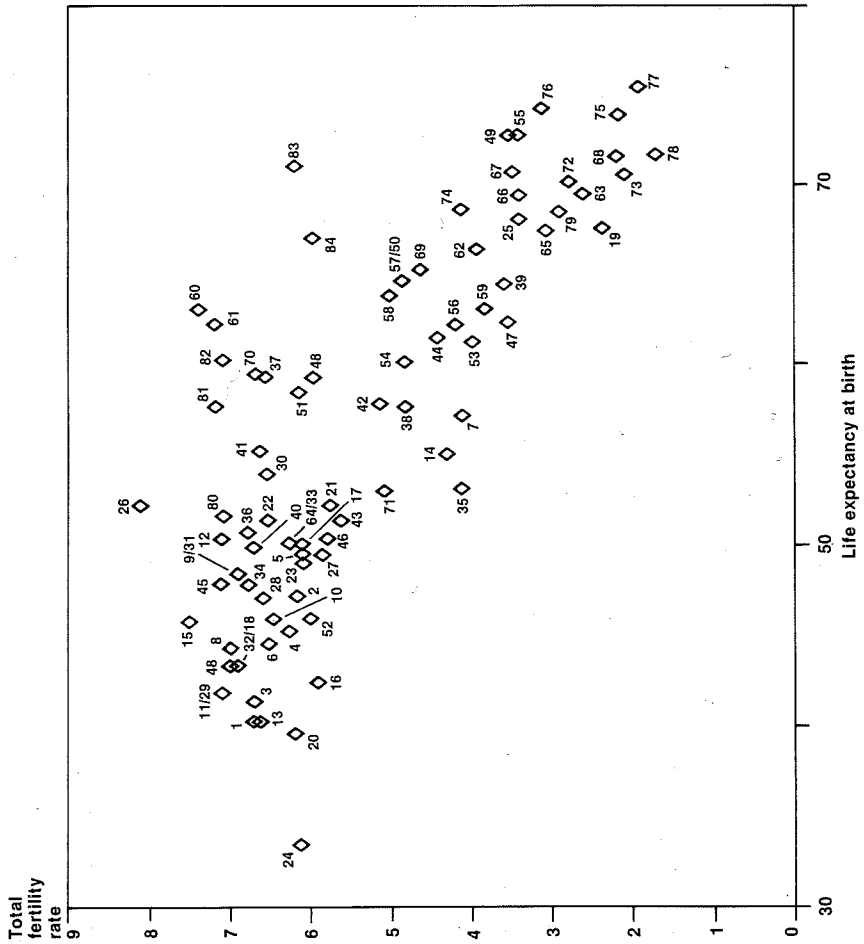


Figure V (*continued*)

Number	*Country*	*Number*	*Country*	*Number*	*Country*
1.	Ethiopia	29.	Senegal	59.	Colombia
2.	Bangladesh	30.	Lesotho	60.	Jordan
3.	Mali	31.	Liberia	61.	Syrian Arab Republic
4.	Nepal	32.	Mauritania	62.	Malaysia
5.	Zaire	33.	Bolivia	63.	Chile
6.	Burkina Faso	34.	Yemen	64.	Brazil
7.	Burma	35.	Indonesia	65.	Republic of Korea
8.	Malawi	36.	Zambia	66.	Argentina
9.	Uganda	37.	Honduras	67.	Panama
10.	Burundi	38.	Egypt	68.	Portugal
11.	Niger	39.	El Salvador	69.	Mexico
12.	United Republic of Tanzania	40.	Côte d'Ivoire	70.	Algeria
		41.	Zimbabwe	71.	South Africa
13.	Somalia	42.	Morocco	72.	Uruguay
14.	India	43.	Papua New Guinea	73.	Yugoslavia
15.	Rwanda	44.	Philippines	74.	Venezuela
16.	Central African Republic	45.	Nigeria	75.	Greece
		46.	Cameroon	76.	Israel
17.	Togo	47.	Thailand	77.	Hong Kong
18.	Benin	48.	Nicaragua	78.	Singapore
19.	China	49.	Costa Rica	79.	Trinidad and Tobago
20.	Guinea	50.	Peru	80.	Oman
21.	Haiti	51.	Guatemala	81.	Libyan Arab Jamahiriya
22.	Ghana	52.	Congo		
23.	Madagascar	53.	Turkey	82.	Saudi Arabia
24.	Sierra Leone	54.	Tunisia	83.	Kuwait
25.	Sri Lanka	55.	Jamaica	84.	United Arab Emirates
26.	Kenya	56.	Dominican Republic		
27.	Pakistan	57.	Paraguay		
28.	Sudan	58.	Ecuador		

Fourth observation. Education occupies first place among the socio-economic factors of fertility

Although income does not seem to be the only or the most decisive factor in declining fertility, there is nevertheless a correlation between these two items at the national level, as can be seen from figure VI for the developing countries. A higher per capita income is associated with lower fertility, just as figure III showed that a higher income is associated with higher life expectancy at birth.

Here, too, it is interesting to note the "aberrant" points. First, those in the lower left section of the graph, which includes the points for China, Sri Lanka, Indonesia, Costa Rica, Thailand and the Philippines. Then those in the upper right section, which includes the points for the oil-producing countries. In the first group the points are at the intersection of low income and low fertility; in the second group they are at the intersection of high income and high fertility.

A United Nations analysis,[6] based on data collected by the World Fertility Survey,[7] shows the following:

Figure VI. Ratio of per capita national income to total fertility rate in the third world

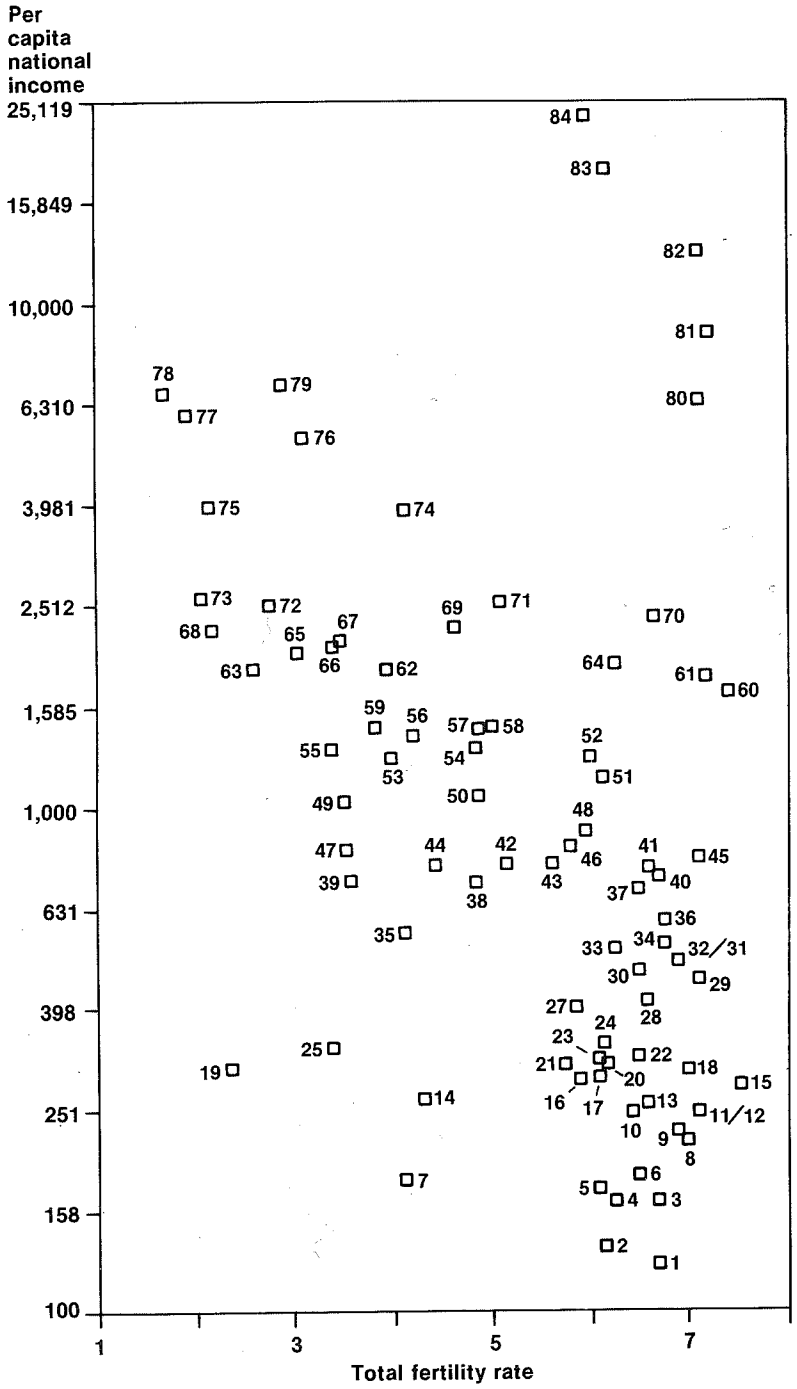


Figure VI (*continued*)

Number	*Country*	*Number*	*Country*	*Number*	*Country*
1.	Ethiopia	29.	Senegal	59.	Colombia
2.	Bangladesh	30.	Lesotho	60.	Jordan
3.	Mali	31.	Liberia	61.	Syrian Arab Republic
4.	Nepal	32.	Mauritania	62.	Malaysia
5.	Zaire	33.	Bolivia	63.	Chile
6.	Burkina Faso	34.	Yemen	64.	Brazil
7.	Burma	35.	Indonesia	65.	Republic of Korea
8.	Malawi	36.	Zambia	66.	Argentina
9.	Uganda	37.	Honduras	67.	Panama
10.	Burundi	38.	Egypt	68.	Portugal
11.	Niger	39.	El Salvador	69.	Mexico
12.	United Republic of Tanzania	40.	Côte d'Ivoire	70.	Algeria
		41.	Zimbabwe	71.	South Africa
13.	Somalia	42.	Morocco	72.	Uruguay
14.	India	43.	Papua New Guinea	73.	Yugoslavia
15.	Rwanda	44.	Philippines	74.	Venezuela
16.	Central African Republic	45.	Nigeria	75.	Greece
		46.	Cameroon	76.	Israel
17.	Togo	47.	Thailand	77.	Hong Kong
18.	Benin	48.	Nicaragua	78.	Singapore
19.	China	49.	Costa Rica	79.	Trinidad and Tobago
20.	Guinea	50.	Peru	80.	Oman
21.	Haiti	51.	Guatemala	81.	Libyan Arab Jamahiriya
22.	Ghana	52.	Congo		
23.	Madagascar	53.	Turkey	82.	Saudi Arabia
24.	Sierra Leone	54.	Tunisia	83.	Kuwait
25.	Sri Lanka	55.	Jamaica	84.	United Arab Emirates
26.	Kenya	56.	Dominican Republic		
27.	Pakistan	57.	Paraguay		
28.	Sudan	58.	Ecuador		

(*a*) In the five years preceding the Survey, fertility was clearly higher in rural than in urban areas of Africa and Latin America. In Colombia, Kenya and Venezuela, the fertility of rural women was 40 to 50 per cent higher than that of urban women. However, the association is less clear in Asia;

(*b*) In countries with relatively low education levels (Bangladesh, Ghana, Haiti, Indonesia, Jordan, Kenya, Nepal, Pakistan, Senegal and the Syrian Arab Republic), the fertility rate is almost the same in rural and urban areas. In contrast, in countries with average education levels (Colombia, the Dominican Republic, Fiji, Lesotho, Malaysia, Mexico, Paraguay, Peru, the Philippines, the Republic of Korea, Sri Lanka, Thailand and Venezuela) or with high education levels (Costa Rica, Guyana, Jamaica, Panama and Trinidad and Tobago), fertility is clearly higher in rural than in urban areas, regardless therefore of the region. It seems that the process of socio-economic development, to the extent that it can be determined by the education level, has the effect of lowering fertility in both rural and urban areas, but that the decline is faster in urban areas, so that the difference between urban and rural fertility tends to increase in step with the development process;

(*c*) Migration to third-world towns can have the effect of slowing the decline in fertility in urban areas, since the immigrants often retain for a fairly long time their original rural fertility. This has been found in Kenya and Lesotho, for example;

(*d*) The industrialized countries also have higher fertility in the countryside than in the towns, despite the almost equal use of contraception in both locations. The association persists even after standardization to eliminate the effect of other factors, such as income or education;

(*e*) The parents' education is one of the clearest factors differentiating fertility. The relationship is negative in the third world in the sense that the higher the education level (of husband or wife) the lower the fertility. However, this inverse relationship varies according to development level and region. At the beginning of the modernization process the relationship is unclear and it is only in the case of women with a high level of education (more than six years) that fertility begins to decline, all other things such as income or urban/rural residence being equal. When the development process is well established, the relationship then emerges and the range of fertility by education level grows steadily wider. The World Fertility Survey showed, for example, that given equal social status, Costa Rican women with no education had an average of 5.5 children, while women with an average of 10 years schooling had only 3.7 children. In Nepal the range is almost zero, the figures being 3.39 and 3.55 respectively. The importance of education as a determinant of fertility varies among regions and countries. It seems to be particularly important in the countries of Latin America, the Maghreb and Western Asia, and of little importance in the countries south of the Sahara. In the industrialized countries, the relationship is not clear and in some of them it is even reversed, with the highest education levels having a slightly higher fertility rate than the next-lower levels. The relationship is U-shaped, but the second arm of the letter is shorter than the first.

Fifth observation. The demand for contraception has never been so strong in the third world

The clearest indication that the downtrend in fertility will grow stronger is the large proportion of married women who do not want any more children, according to the World Fertility Survey. The results of the first surveys show this proportion ranging from 12 per cent in Côte d'Ivoire to 77 per cent in the Republic of Korea, with a weighted average of 53 per cent (see table 10). The more children the women have, the higher the percentage. In all countries, the proportion of women with four living children who do not want any more ranges from 52 per cent in Malaysia to 92 per cent in the Republic of Korea (this statistic does not include the African countries). There are other figures that augur well for a decline in family size, with a concentration around the average size: women who have no children or who have one child want to have an average of between three and four, while women who have had more than five children want a maximum of between four and six. There is a strong

generational effect: the youngest women state a lower desirable number of children than the oldest women. Even more striking is the proportion of married women who did not want their last child or their present pregnancy: 46 per cent in Peru, 42 per cent in Colombia, 37 per cent in the Republic of Korea, 34 per cent in Sri Lanka, 34 per cent in Panama and 28 per cent in Costa Rica. There is no doubt that these countries have a considerable potential demand for contraception and that the needs are far from being satisfied.

To enable couples to have the number of births they want and to space them as they want now seems essential for the balance and health of the entire family, and moral, cultural and even political objections have now given way throughout Latin America and Asia.

Sixth observation. Modern methods of family planning are increasingly available in the third world

Modern means of family planning, which have clearly been available to the inhabitants of the industrialized countries during the several decades that their fertility has been declining, are now available in almost all third-world countries. However, the transfer of this technology is not effective unless the population is motivated to use contraceptives and the social setting is favourable, that is, the Governments are in favour, and unless the cultural environment presents no obstacles and the medico-social apparatus is technically capable of ensuring the efficiency, distribution and monitoring of means of family planning. Most of the population in many countries of Latin America and Asia are becoming aware of the existence of such services. But these services are not widely known in sub-Saharan Africa and are available to only a small minority of the population. Table 11 sets out the available information about the knowledge and use of contraception. As was to be expected, knowledge and use of contraception are closely linked with women's education and degree of urbanization.[8]

In 30 developing countries that participated in the World Fertility Survey, 100 users of contraception in urban areas included 17 per cent sterilization, 10 per cent IUDs, 48 per cent pills, condoms, gels and diaphragms and 26 per cent so-called traditional methods. In rural areas the percentages are almost the same for sterilization and IUDs, a little lower for pills, condoms, gels and diaphragms, and a little higher for traditional methods.

In the industrialized countries, according to surveys carried out between 1975 and 1982, between two thirds and four fifths of married women use contraception. The lowest percentages are found in Spain, Yugoslavia and Romania, and the highest in Belgium and the Scandinavian countries. The proportion was relatively low in Japan (61 per cent), where the pill is banned. The women who were not using contraception included, in proportion varying according to country, those who wanted to be pregnant, or were pregnant, or knew themselves to be barren.

TABLE 10. PERCENTAGE OF WOMEN WHO DO NOT WANT ANY MORE CHILDREN
(Married women aged 15 to 49)

Country	*Survey year*	*Total*	*Rural*	*Urban*
Latin America and Caribbean				
Barbados	1981	52.5	—	—
Colombia	1976	63.2	64.5	62.6
	1978	72.5	70.5	73.7
	1980	69.2	68.6	69.2
Costa Rica	1976	56.0	59.9	53.6
	1978	55.8	54.7	56.7
	1980	54.6	53.5	55.6
Dominican Republic	1975	55.5	58.2	52.4
Ecuador	1979	59.4	59.2	59.6
Guyana	1975	61.6	64.2	54.4
Haiti	1977	50.3	49.2	53.2
Honduras	1981	48.1	45.0	54.5
Jamaica	1975/76	66.6	69.9	62.7
Mexico	1976/77	62.5	60.6	63.9
	1978	60.8	56.1	64.6
Panama	1976	65.6	68.4	63.4
Paraguay	1979	38.5	39.8	36.8
Peru	1977/78	65.5	64.4	66.2
	1981	74.6	70.6	76.4
Trinidad and Tobago	1977	58.2	61.2	55.6
Venezuela	1977	56.4	59.9	55.5
Asia				
Bangladesh	1979	50.1	49.2	55.4
Fiji	1974	54.8	53.2	58.1
Indonesia	1976	49.2	48.6	51.7
Republic of Korea	1974	75.3	76.4	64.4
	1979	77.3	79.6	75.7
Malaysia	1974	50.5	47.5	57.2
Nepal	1976	37.9	38.1	62.7
	1981	41.1	40.2	54.7
Pakistan	1975	49.7	47.6	54.5
Philippines	1978	59.4	58.0	62.0
Sri Lanka	1975	66.6	66.3	68.1
Thailand	1975	67.5	68.6	61.4
	1978	69.5	70.0	67.3
	1981	67.5	67.7	66.5
Middle East and North Africa				
Egypt	1980	58.0	51.0	67.3
Jordan	1976	48.3	36.7	53.2
Syrian Arab Republic	1978	44.3	33.9	55.0
Tunisia	1978	55.7	51.0	64.2
Yemen	1979	28.8	27.4	39.8
Sub-Saharan Africa				
Cameroon	1978	22.7	23.1	20.9
Ghana	1979/80	20.0	20.9	19.6
Côte d'Ivoire	1980/81	12.2	12.9	10.9
Kenya	1977/78	25.0	25.3	23.2
Lesotho	1977	26.0	26.0	27.7
Sudan	1979	26.9	24.5	34.3

Source: B. L. Boulier, *Evaluating Unmet Need for Contraception. Estimates for Thirty-Six Developing Countries* (Washington, D.C., World Bank, 1985).

TABLE 11. KNOWLEDGE AND USE OF CONTRACEPTION IN SOME DEVELOPING COUNTRIES

		Percentage of married women who		
Country	*Survey year*	*Know a method*	*Have used a method*	*Currently use a method*
Africa				
Kenya	1977	88	32	7
Asia and Oceania				
Bangladesh	1976	83	15	8
Fiji	1974	100	69	40
Indonesia	1976	80	38	26
Jordan	1976	97	46	25
Malaysia	1974	92	50	33
Nepal	1976	22	4	2
Pakistan	1975	75	10	5
Philippines	1978	94	58	36
Rep. of Korea	1974	98	59	35
Sri Lanka	1975	92	45	32
Thailand	1975	97	48	33
Latin America				
Colombia	1978	94	62	46
Costa Rica	1976	100	84	64
Dominican Republic	1975	97	49	32
Guyana	1975	96	55	31
Jamaica	1975	98	66	38
Mexico	1978	94	65	40
Panama	1976	99	75	54
Peru	1977	82	50	31

Source: Variations in the Incidence of Knowledge and Use of Contraception: A Comparative Analysis of World Fertility Survey Results for Twenty Developing Countries (ST/ESA/SER.R/40).

Seventh observation. The decline in fertility is a function of development levels and family planning efforts

When a downtrend in fertility is observed, it is difficult to know what part is due to family planning programmes and what to the general development movement. What are the effects of the efforts to achieve socio-economic progress, which is not usually dictated by the desire to reduce fertility, and what are the effects of birth control programmes designed to act directly on the fertility of couples? The questions seem simple but the answers are not easy, for other factors can come into play, such as changes in the marriage rate or the age structure. Elaborate statistical techniques have been devised to try to give an answer, that is, to assess the number of births prevented by family planning programmes. There is agreement that, in view of the results of the calculations, the effect of these programmes as such is important in many countries in which they have been used (Malaysia, Singapore, Thailand, Mauritius, Sri Lanka, Tunisia and Mexico).

TABLE 12. CHANGES IN THE TOTAL FERTILITY RATE BY DEVELOPMENT LEVEL AND MAGNITUDE OF THE FAMILY PLANNING EFFORT, 1960-1965/1980-1985[a]

Development level	Family planning effort: Vigorous — Country	%	Moderate — Country	%	Weak — Country	%	Insignificant — Country	%	Average
High	Singapore	−64.3	Cuba	−57.8	Brazil	−38.0	Lebanon	−40.3	
	Hong Kong	−60.9	Colombia	−41.5	Mexico	−31.6	Paraguay	−26.7	
	Rep. of Korea	−54.2	Chile	−42.2	Venezuela	−35.4	Peru	−27.2	
	Mauritius	−51.8	Fiji	−47.5			Kuwait	−16.7	−38.3
			Panama	−41.6			Jordan	+ 2.9	
			Costa Rica	−49.6			Libyan Arab Jamahiriya	0.0	
High average	China	−56.7	Thailand	−44.1	Turkey	−25.8	Mongolia	−15.7	
			Malaysia	−44.8	Egypt	−20.3	Nicaragua	−19.1	
			Philippines	−36.1	Guatemala	− 3.6	Algeria	− 5.1	
			Dominican Rep.	−42.9	Ecuador	−14.1	Syrian Arab Republic	− 3.9	−19.2
			Tunisia	−31.4	Morocco	− 9.9	Congo	+ 2.0	
			Sri Lanka	−34.2	Honduras	−11.7	Ghana	+ 0.3	
			El Salvador	−18.8			Zaire	+ 0.2	
							Zambia	+ 2.1	
							Iraq	− 7.1	
Low average			Indonesia	−28.2	Haiti	− 6.6	Democratic Kampuchea	−18.6	
			India	−32.3	Pakistan	−18.3	Burma	− 8.7	
			Viet Nam[b]	−23.8	Kenya	− 0.4	Yemen	− 1.4	
							Bolivia	− 5.6	
							Côte d'Ivoire	+ 1.4	
							Nigeria	+ 3.3	− 5.8
							Senegal	+ 1.1	
							Liberia	+10.0	
							Madagascar	+ 5.2	
							Mozambique	+ 6.8	
							Uganda	− 0.1	
							Cameroon	+ 0.3	
							Zimbabwe	− 0.2	
							Lesotho	+ 0.7	
Low					Bangladesh	− 7.9	Mauritania	+ 0.6	
					Nepal	+ 6.7	Lao People's Democratic Republic	+ 2.8	
							Burundi	+13.2	
							Afghanistan	− 1.6	
							Guinea	− 3.1	
							Togo	− 1.0	
							Niger	+ 0.6	
							Central African Rep.	+ 4.1	+1.1
							Chad	− 1.8	
							Ethiopia	+ 0.6	
							Malawi	+ 1.9	
							Rwanda	+ 6.9	
							Sierra Leone	+ 0.3	
							Sudan	− 1.5	
							United Republic of Tanzania	+ 3.5	
							Burkina Faso	0.0	
							Yemen	− 3.0	
							Somalia	− 0.3	
							Mali	+ 2.8	
Average (%)		−57.6		−38.6		−15.5		− 2.8	
No. of countries		(5)		(17)		(14)		(48)	84

Sources: For the classification of countries by development level and family planning effort, see R. J. Lapham and P. W. Mauldin, "Family planning programme effort and birth rate decline in developing countries", *International Family Planning Perspectives*, vol. 10, No. 4 (1984), table 4, p. 115. The percentage changes in the current fertility rate are derived from *World Population Prospects. Estimates and Projections as Assessed in 1982* (United Nations publication, Sales No. E.83.XIII.5), annex IV.

[a] A minus sign (−) indicates a decrease; a plus sign (+) an increase.

[b] For 1972, only the effort of the North Vietnamese programme.

However that may be, table 12, reproduced from a study by J.-C. Chasteland and M. Szykman,[9] shows clearly that it is in the countries with the most advanced development that the family planning efforts have been most vigorous and the highest percentage reductions have been achieved in the fertility rate.

D. Age structures

The evolution of fertility and mortality, which have just been described, and to some extent the evolution of migration, have the effect of modifying the age structures. A population is an open system "fed" continuously by births, forming in the course of a year what demographers call age-groups or generations. These generations are constantly "casting out" members through death. The numbers of survivors in each generation juxtaposed at a given time in terms of the year of formation constitute the age structures or age pyramid. This is one of the first schemes taught in schools to explain population dynamics.

It is well known that these schemes can take many different forms. When fertility has remained high for many years, the shape is a pyramid with a broad base and pointed apex. When fertility has been in decline for a long period and mortality has also fallen, the base of the age structure is narrow and the apex rounded. There are many intermediate shapes, depending on the evolution of the demographic components. The United Nations recently carried out a study showing the effects of variations in fertility and mortality on age structures in the developing countries and the industrialized countries.[10]

How have these structures evolved, and how will they evolve in the world and its regions? In order to answer these questions, it is necessary to study a long period of time, for a generation born in a given year will pass through all the age-groups for almost a century before it dies out.

The age structure of the world population in 1985 was as follows:

	Percentage
0-14 years	33.4
15-24 years	19.5
25-59 years	38.3
60 and over	8.8

This is not significantly different from the 1950 structure, but it will undergo a long process of aging which will produce the following structure in 2025:

	Percentage
0-14 years	24.8
15-24 years	15.8
25-59 years	45.2
60 and over	14.3

Between these two dates it will have aged "from the bottom", owing mainly to the expected fall in fertility in the third world, and "from the top", owing to the constant deferral of death through lower mortality.

A more detailed examination shows that the proportion of children (0-14 years) and young people (15-24 years) follows a switchback curve. It increased between 1950 and 1970, then set out on a long downward path. The rising part of the curve is explained by the decline in infant and child mortality, which had the same effect on age structures as increased fertility would have had, creating a kind of temporary rejuvenation of the population. The falling part of the curve is explained by the increasing effect of the current and indeed the expected declines in fertility on the numbers of children and young people. This decline will not end until the first quarter of the next century, when the fall in fertility will have completed its downward course.

Of the main age groups, the 65 and over group will grow most rapidly. In absolute figures, it grew from 132 million in 1950 to 277 million in 1985 and will reach 773 million in 2025, that is, it will increase by a factor of 6 in 75 years, whereas the total population will grow in the same period by only 3.2 times. The growth will be greatest in the developing countries: 7.7 times, against 3.8 times in the industrialized countries.

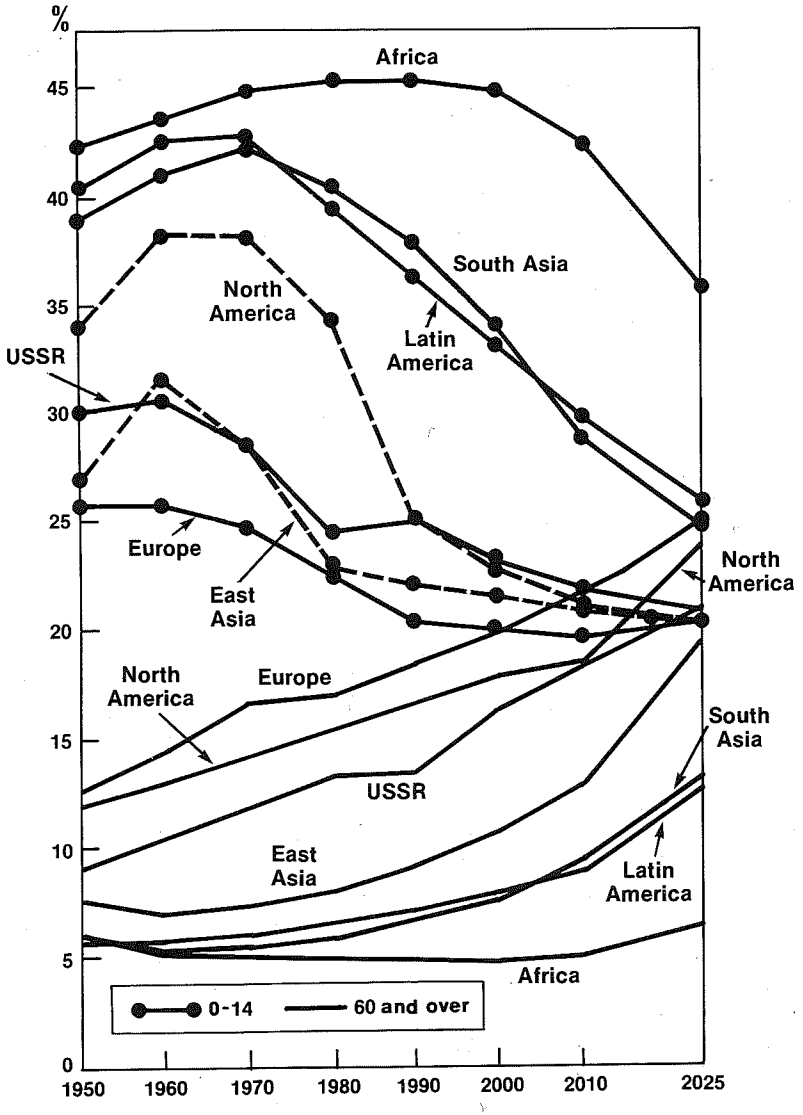
The over-60 group will exceed 1 billion in 2025, with 1,135 million, of which 806 million will be in the third world and 329 million in the industrialized countries. In 1985, there was a small difference in the figures for these two groups, but in 2025 there will be two and a half times more persons aged 60 and over in the third world than in the industrialized countries.

Demographic aging is a phenomenon often disregarded in the long list of difficulties facing the third world. However, it will become one of the major economic and social problems, as an ineluctable demographic change takes place in countries that are hardly prepared to cope with it because it is completely new. Here, the experience of the industrialized countries is a rich source which should be a useful guide for action in the third world.

Given the variety of demographic situations and population projections, it is hardly surprising that the aging situation is also varied (see figure VII and the accompanying data).

Fertility has been declining for at least a century in Europe and North America. The proportion of persons aged 60 and over was already over 15 per cent in 1985. This process will continue implacably and in 2025 the proportion is expected to be 25 per cent in Europe (one in four), 23.8 per cent in North America and 20.7 per cent in the USSR. There will then be more people over the age of 60 than under the age of 15, except in the USSR (18.1 per cent in Europe, 20.1 per cent in North America and 22.1 per cent in the USSR). If the situation in the USSR is slightly less worrying from the standpoint of aging than it is in Europe and North America, it is because the USSR includes, as we have seen, a fairly large proportion of Asian populations with relatively high fertility rates. In the European part of the USSR, the situation is not significantly different from that of Western Europe.

Figure VII. Evolution of the proportion of 0-14-year-olds and persons aged 60 and over



Source: United Nations, "Global trends and prospects of aging population structures", *Economic and Social Implications of Population Aging: Proceedings of the International Symposium on Population Structure and Development, Tokyo, 10-12 September 1987* (ST/ESA/SER.R/85)

DATA FOR FIGURE VII

Year	*Africa*	*Latin America*	*North America*	*East Asia*	*South Asia*	*Europe*	*USSR*
0-14 years							
1950	42.4	40.5	27.2	34.1	39.1	25.4	30.1
1960	43.6	42.5	31.3	38.0	41.0	25.8	30.7
1970	44.8	42.4	28.4	38.2	42.2	24.9	28.6
1980	45.0	39.3	22.5	34.3	40.4	22.4	24.3
1990	45.3	36.5	22.0	25.2	36.9	20.1	25.1
2000	44.7	33.3	21.6	23.8	33.0	19.3	23.5
2010	42.6	29.8	20.4	21.4	28.8	18.5	22.6
2025	35.3	26.0	20.1	19.5	23.8	18.3	22.1
60 years and over							
1950	5.6	5.4	12.1	7.4	6.1	12.9	9.0
1960	5.0	5.7	13.0	7.3	5.7	14.4	10.1
1970	5.0	6.0	13.8	7.2	5.7	16.6	12.0
1980	4.9	6.5	15.5	7.9	5.9	16.9	13.1
1990	4.8	7.0	16.4	9.0	6.4	18.3	13.1
2000	4.8	7.7	16.0	10.5	7.3	19.8	17.5
2010	4.9	8.8	18.1	12.4	9.3	21.3	16.8
2025	6.1	12.4	23.8	19.3	12.2	25.0	20.7

Three features of the rich countries should be noted: first, aging in the active population owing to the progression of the "baby boom" generations into the upper sections of the active ages, as the more recent and less numerous generations begin to enter the first sections; then, a feminization of the elderly population owing to the excess male mortality, which increases in the older ages; lastly, aging in the elderly population itself. The number of "very old old", that is, the over-80s, increased from 8.1 million in 1950 to 24 million in 1985 and will reach 47 million in 2025; two thirds of this last figure will be women. This "aging of the old" thus seems to be a relatively recent phenomenon. The very old are of course particularly vulnerable from the health standpoint and they generate their own peculiar problems of medical and social facilities. It is also possible that the figures just given for the increase in their numbers may be underestimates of what can plausibly be expected, for they are based on relatively conservative assumptions about future mortality. If mortality were to decline more quickly than envisaged in the United Nations projections, the aging of the population in the industrialized countries would then be more marked than this document indicates.

In the third world, on the whole, the age pyramid expected in 2015-2020 will be fairly similar to that of the industrialized countries in about 1950. The third world thus has a fairly long breathing space before it encounters even faster aging than the industrialized countries have known.

The African continent, in fact, has experienced not an aging but a rejuvenation of its age structure from the base of the pyramid. The 0-14 group increased from 42.4 per cent in 1950 to 45.1 per cent in 1985, owing both to the increased fertility discussed above and to the fall in infant and child mortality, which has increased child survival. This phenomenon of rejuvenation has been observed throughout the third world

but to a lesser extent than in Africa. And, as everywhere else, it will be a temporary phenomenon followed in the long term by aging through the shrinking of the pyramid's base. The proportion of those over 60 in Africa was the lowest in the third world in 1985, at only 4.9 per cent, and it will not increase until the beginning of the next century, reaching 6.1 per cent in 2025, still the lowest figure in the third world and similar to that of South Asia in about 1950. The delayed aging of Africa seems to be exceptional not only with respect to the industrialized countries but also with respect to the developing regions. The African continent will not actually enter a phase of real aging until after the first quarter of the next century. This does not mean that the problem of the elderly will not arise earlier, but it will be of a peculiar nature. It is to be feared that with migration to the towns or to other countries the elderly may suffer, either because they will have been left out of the migratory movement or because their adaptation to their new surroundings will be difficult by the very reason of their age. The problem of the elderly in Africa is more social than economic or demographic.

Like Africa, South Asia experienced a slight rejuvenation of the base of the age pyramid between 1950 and 1970, owing to the drop in infant and child mortality and not, unlike Africa, to increased fertility. But the pyramid's base began to shrink in 1970. This shift will develop fairly rapidly and it is calculated that the proportion of the population under the age of 15 in 2025 will be only half the 1970 proportion (23.8 per cent against 42.2 per cent). By about 2025, the proportion of those under 15 should be fairly similar to that of Europe in about 1975. The proportion of the population over 60 remained roughly constant from 1950 to 1985 at 6.1 per cent but will double by 2025 to 12.2 per cent, almost equal to the European proportion in 1950.

East Asia, where China predominates, will undergo the most spectacular aging processes in terms of speed, owing to the abrupt drop in fertility and the no less remarkable drop in mortality. The time-lag in the aging process between this region and Europe will continue to narrow. The percentage of children under 15 in East Asia at the end of this century will be the same as in the European countries at about 1980, with a time-lag of only some 20 years. The percentage of the population over 60 in 2025 will be similar to that of the European countries in about 2010 and the time-lag will then be less than 15 years. East Asia, and therefore China, will be almost equal to the industrialized countries in terms of aging in about 2025, reaching the same situation in half the time.

Latin America will undergo an aging process exactly halfway between those of Africa and Asia as a whole, as the following figures show:

	All developing countries (percentage)	*Latin America (percentage)*
0-14 years	25.8	26.0
15-24 years	16.4	16.4
25-59 years	45.2	45.2
60 years and over	12.4	12.4

E. International migration

It may seem paradoxical that international migration, which is so much discussed and which, according to many experts, will acquire increasing importance with the widening gaps in demographic growth and economic progress between countries, involves in reality only a small fraction of the world population. For example, the number of persons alive now and living in a country in which they were not born, who have therefore migrated at least once in their life, is in the order of 50 million, that is, 1 per cent of the world population.

This is a small amount in relative terms but large in absolute ones, especially as the numbers are badly distributed among countries. For some countries, as we shall see, international migration is a source of major demographic change and an important economic factor, especially in respect of the effect on financial balances of funds remitted by migrants.

Migratory movements take many different forms. Unfortunately, the study of these movements is often made difficult by the scarcity and patchiness of the data. The definition of migrant excludes persons who cross a frontier into a foreign country to complete their education there, or for tourism, pilgrimage or nomadism.

Three main types of migrant are usually distinguished:

(*a*) Refugees, that is, persons who flee their countries of residence owing to racial or religious persecution or persecution on the ground of nationality or political opinion. It is generally agreed that the term refugee should be reserved for those mainly political categories and that persons who leave their countries of residence for economic reasons, in particular poverty, are omitted;

(*b*) Migrants, who leave their countries of legal residence voluntarily and have obtained legal authorization for entry and stay from the authorities of the recipient country. Some of these persons are granted all the economic rights enjoyed by nationals and, more rarely, the civil rights as well (right to vote). But others are subject to restrictions usually connected with the exercise of an economic activity. Some are granted authorization for a long-term stay, which sometimes enables them subsequently to acquire permanent residence or citizenship. Others, however, are admitted for only a limited period, sometimes for the sole purpose of doing a specific job for a limited time, and are obliged to leave the country when their work is completed;

(*c*) Illegal migrants, who have not obtained permission to stay and thus escape all statistical reckoning. For example, it is estimated that the number of illegal workers in the United States is between 2.5 million and 4 million, plus their families. Almost half of them are Mexican and most of the other half come from other developing countries. They are in addition to the 5 million legal immigrants.

A better general picture of the migratory phenomenon is obtained from the "stocks" than from the "flows". In other words, it is somewhat easier to analyse the statistics on resident aliens or persons born abroad,

for example at the time of a census, than to analyse the statistics on the entry and exit of migrants.

The use of place of birth is a good indicator of international migration. Of course, this is a fairly narrow criterion which does not take into account shifts of residence through several countries, but international comparison is easier than in the case of flow statistics. Moreover, this kind of approach pays little attention to changes that may have occurred over time. For example, during the years of strong economic growth (1960-1970), the countries of Western Europe encouraged immigration. With the crisis and the changes in economic structures produced by the new labour-saving technologies, there has been a return to immigration policies in these countries. The sharp shifts in the price of oil have had a similar effect on immigration into the oil-producing countries. None of this can appear in the statistics on "stocks" of migrants, representing the number of persons born abroad, unless these statistics are available for sufficiently close intervals for the successive differences to be calculated. This is hardly possible with censuses that take place every five years at best. But it is known from several sources that emigration to the oil-producing countries has declined considerably in the past 10 years.

Table 13 lists the countries with the highest proportion of persons born abroad, and table 14, the countries with the largest number of persons born abroad.

TABLE 13. COUNTRIES WITH THE HIGHEST PROPORTION OF PERSONS BORN ABROAD

Country	*Date*	*Population (in thousands)*	*Number of persons born abroad (in thousands)*	*Proportion of persons born abroad*	*Male rate*
Australia	1981	14 576	3 004	20.6	1.07
Bahamas	1970	169	31	18.4	1.20
Bahrain[a]	1981	351	112	32.0	3.09
Canada	1981	24 084	3 867	16.1	0.98
Côte d'Ivoire[a]	1975	6 703	1 426	21.3	—
France	1982	54 273	6 001	11.1	1.09
Gambia	1973	493	54	11.1	1.57
Israel	1983	3 350	1 422	42.5	0.92
Kuwait	1980	1 358	576	42.4	2.00
Liechtenstein[a]	1981	26	10	36.9	1.15
Luxembourg	1981	365	87	23.8	0.94
Monaco	1982	27	18	66.0	0.82
Nauru	1977	7	3	42.5	1.33
New Zealand[a]	1981	3 143	464	14.8	1.04
San Marino	1976	19	8	42.7	0.87
Saudi Arabia	1974	6 726	791	11.8	2.01
Singapore	1980	2 414	527	21.8	1.02
Switzerland	1980	6 366	1 064	16.7	0.93
United Arab Emirates	1975	558	356	63.9	3.75

Source: Demographic Yearbook 1983 (United Nations publication, Sales No. E/F.84.XIII.1).

[a] Data by nationality and not by place of birth.

TABLE 14. COUNTRIES WITH THE LARGEST NUMBER OF PERSONS BORN ABROAD

Country	*Date*	*Population (in thousands)*	*Persons born abroad (in thousands)*	*Percentage born abroad*	*Male rate*
Argentina	1980	27 947	1 912	6.8	1.00
Australia	1981	14 576	3 004	20.6	1.07
Bangladesh	1974	71 478	759	1.1	. .
Belgium	1981	9 849	879	8.9	1.20
Brazil	1980	119 071	1 811	1.0	1.17
Canada	1981	24 084	3 867	16.1	0.98
Côte d'Ivoire[a]	1975	6 703	1 426	21.3	. .
France	1982	54 273	6 001	11.1	1.09
Germany, Fed. Rep. of[a]	1983	61 423	4 535	7.4	1.36
India	1981	685 185	7 938	1.2	1.12
Israel	1983	3 350	1 422	42.5	0.92
Italy	1971	54 127	937	1.7	0.75
Malaysia	1980	13 070	750	5.7	1.14
Poland	1970	32 642	2 087	6.4	0.85
Saudi Arabia[a]	1974	6 726	791	11.8	2.01
South Africa	1980	25 017	963	3.9	1.94
Switzerland	1980	6 366	1 064	16.7	0.93
Turkey	1980	44 737	868	1.9	1.01
United Kingdom	1981	48 522	4 211	8.7	0.99
United States	1980	226 546	14 080	6.2	0.88
Venezuela	1981	14 517	1 039	7.2	1.10

Source: Demographic Yearbook 1983 (United Nations publication, Sales No. E/F.84.XIII.1).

[a] Data by nationality and not by place of birth.

The following comments can be made:

(*a*) A fairly small number of countries have encouraged or accepted immigrants. These are essentially the United States, the countries of Western Europe and the Persian Gulf;

(*b*) The industrialized countries generally have a higher proportion of persons born abroad than the developing countries. The developing countries with a high proportion of persons born abroad are usually small in size;

(*c*) The United States has the most persons born abroad (14 million) but this figure represents only 6.2 per cent of the total population;

(*d*) Of the industrialized countries, Australia has the highest proportion of persons born abroad (20.6 per cent), followed by Switzerland (16.7 per cent), Canada (16.1 per cent), New Zealand (14.8 per cent) and France (11.1 per cent). All these countries adopted a policy of encouraging permanent immigration, at least during the economic growth of the 1960s and the 1970s, and they have large "stocks" of migrants; since the economic slowdown at the beginning of the 1980s, some of them have been trying to reduce these "stocks" by offering incentives for repatriation. Furthermore, many countries of Western Europe have a proportion of persons born abroad in excess of 5 per cent (Belgium, France, the

Federal Republic of Germany, Ireland, Luxembourg, Switzerland and the United Kingdom);

(*e*) India has the second largest number of persons born abroad, with almost 8 million, which is only 1.2 per cent of the Indian population. It seems in fact that the phenomenon is due essentially to the partition of India at the time of independence;

(*f*) The countries of the Persian Gulf have fairly high proportions of persons born abroad (Bahrain, Kuwait, Saudi Arabia and the United Arab Emirates), who were taken in mainly during the 1970s. In these countries, many immigrants had a limited residence permit in connection with the so-called "keys in hand" projects. They came from countries of the region or from North Africa, India, the Republic of Korea, Pakistan and the Philippines. In recent years, the recipient countries of this region have tended to adopt measures to regulate immigration and manpower recruitment more strictly and to ensure rotation of this manpower;

(*g*) In Africa, Côte d'Ivoire has the highest proportion of persons born abroad (21.3 per cent), followed by the Gambia (11.1 per cent). It should be noted that few African Governments accept permanent immigrants;

(*h*) Two countries stand out in Latin America, both having a policy of encouraging permanent immigration: Venezuela (1 million or 7.2 per cent) and Argentina (almost 2 million or 6.8 per cent). In contrast, Brazil, which has always promoted a policy of population growth, has less than 2 million persons born abroad, representing only 1 per cent of the total population;

(*i*) The countries with populations over 1 million and high proportions of persons born abroad include Israel (42.5 per cent), Kuwait (42.4 per cent), Singapore (21.8 per cent), Côte d'Ivoire (21.3 per cent) and Australia (20.6 per cent);

(*j*) The proportion of males among the persons born abroad is particularly high in the countries of the Persian Gulf, ranging between two and four to one (there are therefore two to four times more males than females). This high proportion of males is due to the wish of the recipient countries to discourage immigration by members of workers' families. Elsewhere, the proportion of males is usually within the range of 0.8-1.2 to one. In the United States, where the number of persons born abroad is particularly high, the proportion of males is 0.88 to one; female immigrants are more numerous than male because they are employed in services.

Unfortunately, we do not have double-entry summary tables crossing the persons born abroad by country of birth and country of residence for all the countries with heavy immigration. However, of the traditional immigration countries (Australia, Canada, Israel, New Zealand and the United States), in recent years only the United States and Canada have admitted a majority of immigrants from developing regions: Africa, Asia, Latin America and the Caribbean. The United Kingdom of Great Britain and Northern Ireland has been the main source of migrants to these traditional immigration countries, followed by Mexico, the Philippines, Cuba and the Republic of Korea.

The Office of the United Nations High Commissioner for Refugees has estimated that during the period 1980-1985 the number of refugees in the developing countries increased from about 6.5 million to about 8.2 million, while their numbers remained roughly constant in the industrialized countries at 2 million, so that at the beginning of 1985 the total number of refugees was estimated at 10 million. Some 50 per cent of these refugees are in Asia and 30 per cent in Africa.

III. COUNTRIES IN DEMOGRAPHIC TRANSITION

Populations are usually described according to the stage they have reached in what is known as demographic transition, that is, the change from high and proximate levels of mortality and fertility to low levels, close to replacement levels. Demographic transition is normally broken down into four stages, with the following levels of mortality and fertility (see figure VIII).

First stage (11). High mortality and fertility rates. Life expectancy at birth is less than 45 years, and total fertility rate is higher than 6. The number 11 means that during this stage, mortality is at level 1 and fertility is also at level 1. The populations are represented in rectangle 11 of figure VIII.

Second stage (22). Mortality and fertility rates begin to decline, the former before the latter. Life expectancy at birth is between 45 and 55 years, and total fertility rate is between 4.5 and 6. The number 22 means that mortality and fertility are both at level 2. The populations are represented in rectangle 22 of figure VIII.

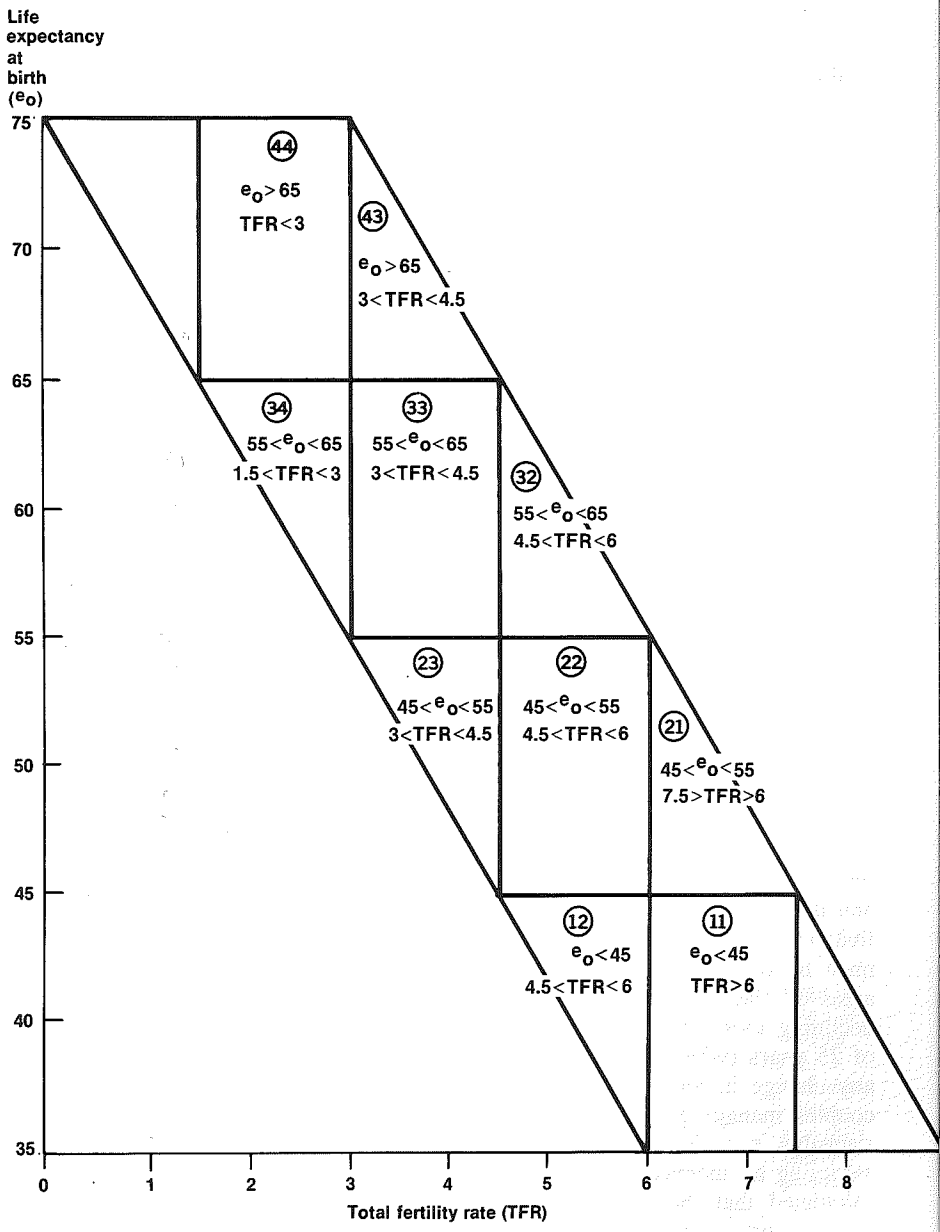
Third stage (33). Accelerated decline in mortality and fertility rates. Life expectancy at birth is between 55 and 65 years, and total fertility rate is between 3 and 4.5. The populations are represented in rectangle 33 of figure VIII.

Fourth stage (44). Low mortality and fertility rates. Life expectancy at birth is over 65 years, and total fertility rate is below 3. The populations are represented in rectangle 44 of figure VIII. It should be noted that, given the trends in mortality rates during this stage, the total fertility rate must be at least 2.1 in order to ensure population replacement.

Of course, not all populations follow this sequence or are represented in the four rectangles of figure VIII. Some "mark time" at level 1 as far as mortality, for example, is concerned, whereas their fertility rates move up to level 2 (triangle 12). Others move more rapidly through the four stages, as in the case of China, which moved quickly from stage 11 to stage 44, whereas a number of African countries never leave stage 11, or do so only very slowly.

All countries follow a trajectory between the two oblique parallels of figure VIII. Represented in triangle 12 are countries where, at a given moment, mortality is at level 1 (life expectancy less than 45 years) and fertility is at level 2 (total fertility rate between 4.5 and 6). Similarly, represented in triangle 21 are countries where mortality is at level 2 and fertility is at level 1.

Figure VIII. Fertility and mortality rates during the process of demographic transition



Chronologically, there are four distinct periods: 1950-1955 and 1980-1985 for the past and 2000-2005 and 2020-2025 for the future, as in the United Nations projections.

The factors that influence fertility rates during the four stages include the so-called "supply of children" and "demand for children". Supply of children is defined as the number of children a couple would have if no methods of preventing births (contraception, abortion) were practised. Demand for children is defined as the size and composition of the family a couple might desire, the question of the means required for attaining this objective being left aside.[11]

The factors that help increase or decrease the supply of and demand for children in the four stages of transition are summarized in table 15.

First stage. High mortality and fertility rates (stage 11 of figure VIII)

It should be recognized that, even before the process of demographic transition begins, high fertility rates are "planned" in the sense that they are necessary for the survival of the group because of high mortality rates. So-called natural fertility is in fact desired and linked to the preservation of certain values. The current concept is that population planning brings about reductions, but it may involve maintaining fertility at a high level. Often, moreover, in traditional societies the community itself exerts pressure on families to keep fertility rates within the norm. Fertility rates have always been planned, contrary to the current view. The demand for children is high among populations before the process of transition begins.

Mortality rates are so high that couples have little inclination to limit the size of their families. On the contrary, they are anxious to keep up the size of their families because the economic contribution of children to the family economy is substantial.

A child is a source of income and social prestige, and an investment for old age. This is the "poor man's insurance". Such an attitude may last long after mortality rates have started to decline in the second stage, because there is no immediate awareness of the change among couples and the general public. T. Locoh has calculated that a father whose objective is to have at least two sons alive at the onset of his old age (60 years) must have eight children, given the high mortality rates in certain rural areas of black Africa.[12] N. Ryder has calculated that in populations with declining mortality rates, moving gradually from life expectancy at birth of 25 years (which is no longer observed anywhere) to 60 years, without any change in fertility rates (6.5 children per woman), the proportion of couples managing to have a surviving male heir who is himself of marriageable age rises from 56 to 79 per cent.[13] Similarly, G. McNicoll, assuming an increase in life expectancy at birth from 25 to 50 years, has calculated that the proportion of couples having two children (male or female) surviving to the age of 20 increases from 47 to 87 per cent, and the proportion with three surviving children increases from 27 to 84 per cent.[14]

TABLE 15. FACTORS INFLUENCING INCREASES OR DECREASES IN SUPPLY OF AND DEMAND FOR CHILDREN DURING DEMOGRAPHIC TRANSITION

Stage of transition	*Factors influencing increases in supply of children*	*Factors influencing decreases in supply of children*	*Factors influencing increases in demand for children*	*Factors influencing decreases in demand for children*
First stage..... $e_0 < 45$ TFR > 6	Early marriage, high marriage rate	Poor health of women (sterility)	Economic contribution of children	
		Prevalence of breast-feeding	Parents' desire for a male heir	
		Post-partum abstinence	High infant mortality	
Second stage..... $45 < e_0 < 55$ $4.5 <$ TFR < 6	Improved health of women			Decreased infant mortality
				School attendance of children
Third stage..... $55 < e_0 < 65$ $3 <$ TFR < 4.5	Decline in breast-feeding	Higher marriage age		Accelerated decrease of infant mortality
				Increased school attendance of children
	Decline in practice of post-partum abstinence			Access to family planning
Fourth stage ..... $e_0 > 65$ $2 <$ TFR < 3	Use of milk substitutes as baby food	Later marriage, lower marriage rate		Low infant mortality
				Change in status of women
				More favourable attitude towards family planning

All these calculations are in agreement. They show clearly that the demographic conditions of transition to a later stage of the demographic cycle, that is, the decline in fertility rates, cannot be met until mortality rates themselves have declined sufficiently.

It should also be noted that, through an apparent paradox, in populations that have not begun the process of transition, the supply of children is smaller than in populations at the end of the process, while actual fertility averages are three to four times higher, mainly as a result of unhealthier conditions, which affect the fecundity of women.

It is recognized that conditions of extreme poverty reduce the supply of children. In China, for example, as a result of the great famine and the "black years" which afflicted the country between 1957 and 1961, the total fertility rate fell from 6.41 to 3.29, that is, by 50 per cent in four years. A similar phenomenon occurred in Bengal in 1943-1944, in Bangladesh in 1973-1974 and in the countries of the Sahel with the great drought of 1973-1974, but, owing to the lack of reliable statistics, it has not been possible to evaluate the actual impact on fertility and fecundity.

Apart from these crises of acute destitution, the population may suffer from chronic poverty, whether in the form of food shortages or in the form of inadequate medical and social infrastructure. In nearly all pre-industrial societies, the probability of pregnancy when contraception is not practised is reduced by health conditions. This is clearly the case in Africa, where female fertility rates increase as soon as the standard of living improves.

Yet another reason is that virtually all the mothers breast-feed. This delays the resumption of ovulation for a significant number, and therefore increases the intervals between births, even if no form of contraception is practised.

Similarly, post-partum abstinence from sexual relations, particularly in sub-Saharan African societies, has the effect of decreasing female fertility rates. Moreover, in some of these populations, post-partum abstinence is a deliberate effort to space births so as to preserve the health of the nursing mother and that of the child.

In this stage, or rather "pre-stage", of transition, the average number of births per woman is between six and eight. (In Kenya, a country with relatively reliable statistics, the number of births per woman at the end of the child-bearing years is even more than eight.) An average of 14 to 18 years separates the beginning and the end of child-bearing—which often means that throughout the child-bearing period the women are for the entire reproductive period either pregnant or nursing—whereas the average is less than five years in countries at the end of the process of transition, that is, mainly the industrialized countries. That is a long time for women to be kept at home and removed from all but traditional activities, which, according to many writers, does not prevent them from accounting for two thirds of the community's working hours, particularly in the fields.

Girls who begin having children at a very early age are not allowed in school or are made to leave school prematurely. They may fail to acquire vocational training.

In terms of health, they may also incur greater risks than those who begin bearing children later (between 16 and 18). Pregnant adolescents must meet nutritional requirements for their own growth, and any deficiency may affect the growth of the foetus. Mothers having a succession of closely spaced pregnancies may have difficulty in reconstituting their nutritional reserves between pregnancies, and, because of iron deficiency, risk a sometimes severe form of anaemia in what is known as the "maternal deficiency syndrome". This is particularly true in areas where chronic malnutrition is prevalent and when the expectant mother or nursing mother does heavy work. Malnutrition in the mother may lead to malnutrition in the infant. When the health of the mother is at risk, the health of the entire family is affected, because women play an essential role in the well-being of the family. One cannot place too much emphasis on the close relationship between the health of the mother and the health of the entire family.

High infant mortality is also a factor influencing increases in the demand for children, because mothers want to "replace" the child they lost. If the child was being breast-fed, the mother also recovers her fecundity after the death of the child. Nevertheless, observations show that the reaction to changes in mortality rates is not systematic and is rarely absolute. In other words, most couples are unable, or do not have the necessary motivation, to replace a dead child by having a baby in addition to the one they would have had if the death had not occurred.[15]

Second stage. Reduction of mortality rates and beginning of reduction of fertility rates

Reduction of mortality rates always precedes—and, as we have seen, even determines—reduction of fertility. It affects all age groups, particularly children, and women of child-bearing age.

Let us imagine that between the first and second stages, life expectancy at birth increases from 40 to 50 years. The percentage of children surviving to their first birthday increases from 80 to 86 per cent and the percentage of females surviving to the age of 16, which in traditional populations is often the age at which child-bearing begins, itself increases from 63 to 73 per cent. Moreover, because the improvement also affects adults, the length of the average child-bearing period increases from about 15 to 18 years. In other words, the reduction of the mortality rate has the triple effect of increasing the number of girls reaching the beginning of the child-bearing period, the length of that period and the survival of children, so that if no contraceptive methods are used to prevent births, the family keeps on growing and the population increases rapidly.

The reduction of the mortality rate will naturally have the effect of simultaneously increasing the life expectancy of the members of the same family, even if they become separated through migration. Again according to N. Ryder,[16] when life expectancy at birth increases from 25 to 60 years, the life expectancy of fathers after marriage increases from 23.5 to 31.2 years, that of mothers from 25.4 to 32.3 years and that of unmarried

daughters from 10.7 to 17.9 years. (In this calculation, it is presumed that boys marry at the age of 25 and girls at the age of 20.) The reduction of the mortality rate, when it occurs, and especially when it accelerates, further increases these life expectancy figures. The reduction of the mortality rate therefore has the twofold effect of increasing the size of the family, which in N. Ryder's model increases from 6.5 to 7.9 children, and the length of time the members of the family live together.

From the point of view of the institution of the family, a sharp reduction of the mortality rate may have serious effects on solidarity between generations, resulting even in what N. Ryder calls a "conflict of generations" in respect of the roles and duties of parents and children.[16] While the duties of children to their parents may easily be fulfilled because these duties are divided among many children, the responsibilities of parents towards their children, on the other hand, become harder to fulfil because the family's resources are divided among an increasing number of children, who cannot all replace the father in the work-place. The extra children will be tempted to find work elsewhere, particularly in the towns, and are likely to marry later.

Hence, when mortality and fertility rates are both very high, the parents are afraid of growing old without a male heir, or a son to carry on the family business, which is often the case with craftsmen and farmers. When mortality rates decrease appreciably without any change in fertility rates, what they are afraid of is the reverse, that is, of having too many heirs, thus causing family assets to be depleted and members of the family to disperse.

TABLE 16. PERCENTAGE OF WOMEN WITH TWO CHILDREN WHO DO NOT WANT ANOTHER CHILD, ACCORDING TO SEX OF THE TWO CHILDREN

	Sex distribution of offspring		
Country	*Two girls*	*One boy and one girl*	*Two boys*
Bangladesh	50	67	69
Colombia	45	53	49
Costa Rica	38	35	32
Dominican Republic	30	22	28
Fiji	23	36	30
Indonesia	32	35	18
Malaysia	15	25	17
Mexico	32	41	37
Nepal	10	27	33
Pakistan	12	35	44
Panama	34	49	34
Peru	46	50	42
Republic of Korea	36	71	77
Sri Lanka	39	60	41
Thailand	33	51	42

Source: T. W. Pullum, "Correlates of family-size desires", *Determinants of Fertility in Developing Countries,* R. A. Bulatao and R. D. Lee, eds. (New York, Academic Press, 1983), vol. 1, pp. 334-368.

One factor that influences the increase in the demand for children, which, although well known, has not yet been measured on a sufficiently large scale, is how the sex distribution of offspring affects the desire to have more children. This is the subject of table 16, which lists 15 third-world countries that participated in the World Fertility Survey. Most of the women with two children expressed the desire to have more, but that desire differs according to the sex of the two children they have had. As the table shows, the women who have had two boys are less desirous of having more children than those who have had two girls. The preference for boys is particularly strong in Bangladesh, Nepal, the Republic of Korea and Pakistan, all Asian countries, while a slight preference for girls is discernible in Peru, Costa Rica, the Dominican Republic, Panama and Indonesia, all of which, with the exception of Indonesia, are Latin American countries. It is true that there are no African countries in this list. The table also shows a greater desire to stop having children when the woman has had one child of either sex than when she has had two children of the same sex.

When the parents have not limited the number of children, their family burden increases, particularly if school attendance becomes increasingly widespread. Children then contribute less to the family economy, and from "net producers" they become "net consumers".

Third stage. Continuing decline in mortality rates and accelerated decline in fertility rates

As mortality rates decline and, more generally, as the modernization of society proceeds, parents become increasingly aware that children are less of an economic asset and that they may even be a liability. Parents begin to see that it is no longer necessary to have so many children to satisfy their emotional needs and their desire to be able to rely on their children in their old age. Child-survival and school-attendance rates continue to increase. Thus, the demand for more children declines and couples begin to resort to family planning in order to space their children or in order not to have any more.

On the supply side, certain factors, such as the decline in breast-feeding, the decline in the practice of post-partum abstinence and improved maternal health, tend to influence increases, whereas other factors, *inter alia,* the higher marriage age, which is always linked to the modernization process, have the opposite effect. On the whole, the factors that tend to reduce both the demand for, and the supply of, children outweigh the factors that tend to increase the supply; that is how the decline in fertility rates begins and how it gathers momentum.

In fact, the influence of breast-feeding on fertility is complex and, in many respects, uncertain. Breast-feeding interrupts ovulation and in many cases does, indeed, tend to reduce a woman's fecundity (it is estimated that for each month she breast-feeds, post-partum amenorrhoea is extended by half a month, on average); by contrast, a decline in breast-feeding has the effect of increasing a mother's fecundity. It is therefore conceivable

that a decline in breast-feeding, if not accompanied by greater use of birth-control methods, might result in higher fertility rates by reducing the intervals between births.

Table 17 indicates how long women breast-feed and the corresponding periods of amenorrhoea in certain countries. It shows that, in many countries, amenorrhoea lasts about 10 to 20 months, being of especially long duration in rural areas. A decline in breast-feeding may also result in higher infant mortality rates, unless steps are taken to ensure the sanitary preparation of baby food and, in particular, a safe water supply. Higher infant mortality rates may, in turn, increase the demand for children.

TABLE 17. DURATION OF BREAST-FEEDING AND AMENORRHOEA AMONG SOME POPULATIONS
(in months)

Population	*Breast-feeding (median)*	*Amenorrhoea (median)*
United States (Boston)	1.5	2.3
Colombia and Venezuela (urban)	6.0	2.9
Thailand (urban)	8.0	4.3
Turkey (urban)	9.0	3.7
Egypt (urban)	11.0	5.2
Philippines (rural)	11.9	5.2
Nigeria (Lagos)	12.2	8.1
Zaire (Bukavu)	15.5	9.0
China (Taiwan Province)	16.1	10.1
India (Bombay)	16.5	11.9
Senegal (Pikine)	18.4	12.8
Zaire (Ngweshe)	18.8	13.8
Guatemala (rural)	19.2	14.8
India (Khanna)	21.0	10.6
Zaire (Idjiwi)	21.8	17.9
Republic of Korea	23.0	13.5
Bangladesh (Matlab)	24.0	18.9
Senegal (rural)	24.3	14.7
Zaire (rural)	26.0	20.0
Indonesia (Mojolama)	26.5	24.0

Source: J. Bongaarts, "The proximate determinants of natural marital fertility", *Determinants of Fertility in Developing Countries*, R. Bulatao and R. D. Lee, eds. (New York, Academic Press, 1983).

As can be seen from table 18, women who have lost at least one child are less likely to use birth control than women whose children all survive. This is true irrespective of the number of children, urban or rural residence, the mother's level of education, the father's occupation or whether the mother is employed. Women who have lost at least one child want to make up for the loss, and this is generally true throughout the third world. In fact, such women will give birth to more children than those whose children all survive, and the more recent the loss, the greater the likelihood of their having another child.

TABLE 18. RELATION BETWEEN LOSS OF A CHILD AND CONTRACEPTIVE USE

Country (1)	*Percentage of women who have used contraception and*		*Percentage of women who are currently using contraception and*	
	have lost at least one child (2)	*have never lost a child* (3)	*have lost at least one child* (4)	*have never lost a child* (5)
Bangladesh	14.8	21.2	10.8	15.4
Colombia	56.5	67.9	50.5	61.8
Costa Rica	81.8	87.1	77.0	82.8
Dominican Republic	53.9	59.0	48.7	53.2
Fiji	74.2	80.3	55.2	65.1
Guyana	54.1	63.3	37.7	44.1
Haiti	35.5	46.2	24.4	31.7
Indonesia	40.6	48.8	43.3	50.4
Jamaica	61.1	75.8	20.0	45.5
Jordan	40.0	55.3	27.7	45.5
Kenya	27.5	41.2	5.6	14.5
Lesotho	28.3	31.3	13.6	11.5
Malaysia	39.5	55.8	38.3	48.2
Mexico	37.6	56.1	34.8	49.8
Nepal	5.5	10.2	0.8	2.0
Pakistan	9.2	17.4	6.7	12.5
Panama	73.3	81.3	71.4	72.0
Paraguay	51.4	60.9	50.4	47.2
Peru	37.4	65.9	30.1	51.6
Philippines	56.8	69.8	44.4	56.4
Republic of Korea	60.3	72.7	50.1	56.8
Sri Lanka	45.5	57.6	44.7	55.1
Syrian Arab Republic	31.9	44.8	27.8	41.7
Trinidad and Tobago	79.1	86.5	58.6	68.3
Venezuela	63.7	75.0	56.4	65.9

Source: S. H. Cochrane and K. C. Zachariah, "Infant and child mortality as a determinant of fertility", *World Bank Staff Working Papers*, No. 556 (Washington, D.C., World Bank).

NOTE: Nearly all the differences between (3) and (2) and between (5) and (4) are significant after standardization of the following criteria: number of children already born, urban or rural residence, mother's education, father's occupation and mother's occupation.

In other words, the sequence would appear to be as follows: a decline in breast-feeding leads to a reduction in the interval between births and higher fertility rates, but also to higher infant mortality rates; the latter may contribute to keeping fertility rates high. The use of contraceptives and the sanitary preparation of baby food may slow or even interrupt this process, the former by lowering the number of births or spacing them out, the latter by increasing the number of infants who survive.

On the other hand, a decline in breast-feeding may help change reproductive behaviour by giving women greater freedom to hold a job, particularly in urban areas.

Thus, it is easy to see the potential positive effect on fertility rates and family well-being of a population policy designed to enable women to have the number of children they want, combined with a maternal and child welfare policy.

It is quite clear that, in countries where the process of demographic transition is about to begin, the factors that affect the status of women are exceptionally important if one wants to understand fertility trends in such countries and how they are likely to evolve.

The modernization process that accompanies the transition and, what is more, explains how it proceeds during the second and third stages, therefore, has contradictory effects on fertility rates. It tends to increase the supply of children because women are healthier and because of the decline in breast-feeding and in post-partum abstinence. However, it also tends to reduce the supply of children because marriage is postponed. Demand for children tends to decrease, especially in the more educated, less economically disadvantaged strata of society, and particularly in urban areas. Women increasingly seek to free themselves from the constraints of constant child-bearing.

Of course, these factors do not all operate simultaneously. Initially, that is, primarily during the second stage, the factors that tend to increase supply are dominant, and the fertility curve rises slightly and temporarily. That is what happened in Europe during the last quarter of the nineteenth century and what happened in Mexico some 20 years ago. As we shall see further on, it is happening at present in Kenya and in other African countries. Towards the end of the second stage and during the last two stages, the factors that tend to decrease demand for children increasingly start to outweigh the factors that tend to increase supply.

It has been pointed out by some that society does not systematically respond to a change in mortality rates with lower fertility rates, even if fertility rates do decline in the long run. A change in mortality rates may be followed, at least initially, that is, during the second stage, by emigration to other lands or to urban centres.[19] Indeed, in some societies there has been neither a decrease in fertility rates nor any emigration. The local population grows and adopts more intensive agricultural techniques,[18] showing that increased population density can have a beneficial effect on an agrarian economy. This argument is well-known, having been advanced some 20 years ago by E. Boserup.[19] However, this situation is only temporary; in the long run, increased density necessarily leads to emigration to other lands or to the cities and, once the modernization process begins, to a drop in fertility rates. Population history shows that there are no exceptions to this rule.

Fourth stage. Restoration of the balance between mortality and fertility rates but at a low level

During this stage the demand for children reaches a low level. The total fertility rate falls to between 2 and 3, and may even fall below the population replacement threshold (2.1); this point was reached by nearly all the industrialized countries 20 years ago, and it is being reached even by some third-world countries (Cuba, Hong Kong, Singapore). China is fast approaching this threshold, and the odds are that other countries, particularly in Asia, will follow suit.

Only a small proportion of women now breast-feed their children, and usually for a short period, since children are being introduced to breast-milk substitutes at an early age without suffering any ill effects. At the biological level, the supply of children is therefore great and female fecundity is close to the estimated total potential of 15 to 17 births. At the sociological level, supply is reduced because people marry later, the marriage rate is lower and divorce is increasingly common. By contrast, not many women become widows during their child-bearing period, so this has little impact on fertility rates. As far as demand is concerned, fertility rates are considerably reduced by a number of factors related to the modernization of society, one of them being the change in the status of women and a more favourable attitude on the part of the authorities towards family planning; at this stage, family planning corresponds to the needs of both the individual and the community. At the same time, contraceptive prevalence, that is, the percentage of women using contraceptives, continues to increase during this stage, reaching as much as 70 or 80 per cent in the industrialized countries.

Reduction of total potential fecundity during the transition

Figure IX shows the factors that reduce fertility rates during the four stages of demographic transition, starting with total potential fecundity, that is, when the marriage rate is at peak level and no methods of limiting births are practised. It is estimated that this total potential fecundity is in the range of 13 to 17 births per woman, depending on the population, the average being 15.3.

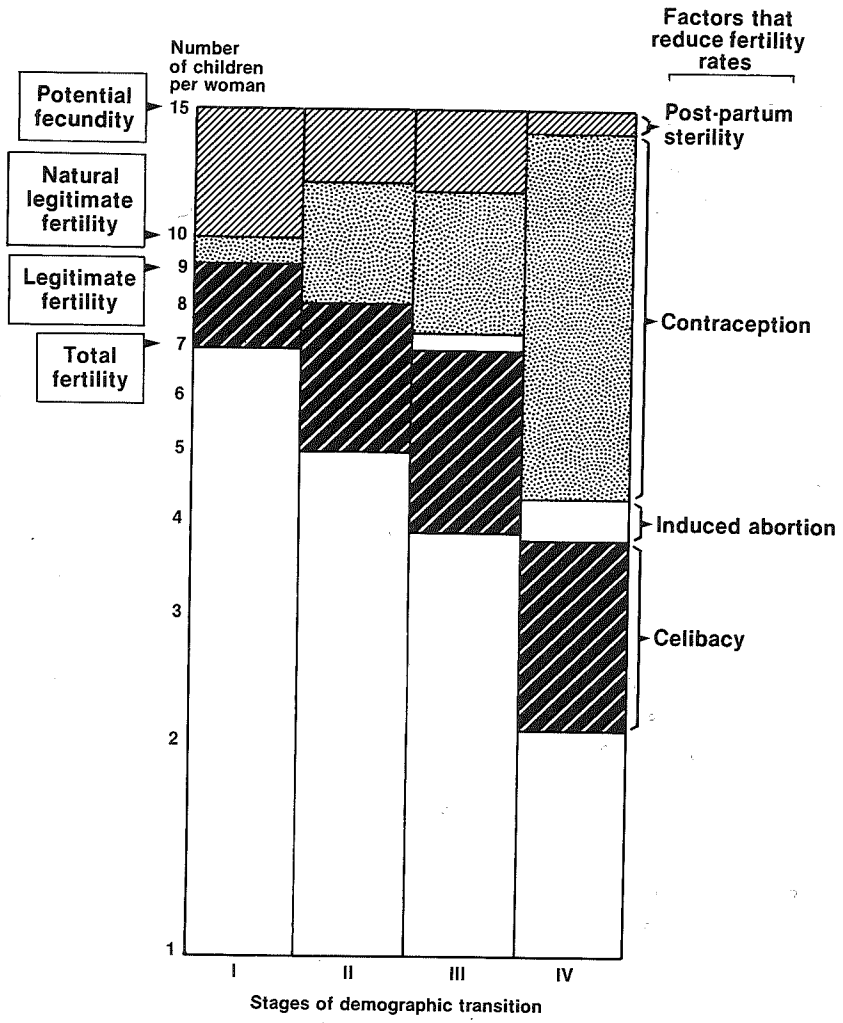
Using the calculations made by J. Bongaarts,[20] J. C. Chasteland and M. Szykman have shown the relative impact of the three main determinants of reduced fertility—sterility, marriage rate and contraception—on total potential fecundity during the four stages of transition.[21]

During the first stage, total potential fecundity of 15.3 is reduced to 10.6 because of female sterility induced primarily by breast-feeding, to 7.8 because marriage does not always coincide with a woman's child-bearing period and because some women are widowed during that period, and then to 7.3 as a result of contraception, which is not very widespread during this stage, and abortion. Total potential fecundity is thus cut approximately in half (from 15.3 births to 7.3). Thus, even in a population that does not practise contraception, actual female fertility rates are half what they could be.

During the second stage, female sterility is at a somewhat lower level than during the first stage, and potential fecundity is reduced from 15.3 to 11.9. It then falls to 7 because of the marriage rate, and to 5.7 because of contraception (and abortion). Total potential fecundity is thus reduced by almost two thirds, from 15.3 to 5.7.

During the third stage, potential fecundity is reduced from 15.3 to 11.3 because of sterility, to 6.1 because of the marriage rate—primarily because people tend to marry later—and to 4.5 because of contraception (and abortion, which becomes more common during this stage).

Figure IX. Factors that reduce fertility rates



Source: J. Bongaarts and R. G. Potter, *Fertility, Biology and Behavior: An Analysis of the Proximate Determinants* (New York, Academic Press, 1983).

Finally, at the end of the fourth stage, female sterility is at such a low level that potential fecundity is scarcely affected, and falls only from 15.3 to 14.2, since women have few children and breast-feed for only a short period. By contrast, family events (marriage, divorce, remarriage) reduce this figure sharply to 7.9, and contraception (and abortion) reduce it just as sharply to 2. Here we have gone from 15.3 to 2, owing, in almost equal measure, to reasons relating to marital history as to contraception, since the impact of sterility at this point is negligible.

In a study covering 31 countries that participated in the World Fertility Survey, the data of which are of high quality, R. Bulatao demonstrated that the transition from a total fertility rate of 7, in many developing countries, to a rate of 2, resulted from an estimated 30 per cent increase in fertility (owing to a decline in breast-feeding), which was largely offset by an estimated 30 per cent reduction (owing to the increase in age at marriage), and a reduction of approximately 85 per cent (owing to contraception and abortion).[11]

Table 19 shows the results of this breakdown for selected countries. In this analysis, total potential fecundity was estimated at approximately 17 births per woman. R. Bulatao sought to work out how much of the reduction from total fecundity was due respectively to marriage delay, breast-feeding, contraception (and abortion) and, finally, to "other factors" (including a number of hard-to-measure factors, such as post-partum abstinence).

Table 19 shows that in countries where fertility has fallen to average levels (3 to 4.5 births per woman), the postponement of marriage has a considerable role in reducing fertility rates. For example, in Colombia, where the total fertility rate is estimated at 4.27, the increase in the age at marriage has meant 4.71 fewer births per woman. In Sri Lanka, where the total fertility rate had fallen to 3.7 in 1975, the increased age at marriage accounted for 5.05 fewer births per woman.

In African countries, breast-feeding is a particularly strong determinant, accounting for a reduction of more than four births per woman, on average, as, too, are "other factors", which means, primarily, post-partum abstinence.

Contraception (and abortion) are minor factors in reducing fertility rates in Africa, relatively important factors in the countries of East Asia and the Pacific (China was not included in table 19, since it did not participate in the World Fertility Survey, but surely postponement of marriage, contraception and abortion must play a major role, and sterility a minor one), and major factors in Latin America. In Panama, contraception accounted for 6.71 fewer births per woman, higher age at marriage accounted for 4.21 fewer births, breast-feeding accounted for 1.45 fewer births and "other factors" for 1.18 fewer births, leaving only 3.84 actual births per woman.

Passage through the stages of transition

To what extent do countries follow the sequence of the transition model, that is, the four stages (11-22-33-44) described at the beginning of chapter III and shown in figure VIII? And to what extent does that model correspond to United Nations projections to the year 2025?

Let us try to answer those questions by referring to tables 4, 5 and 20 of chapter II, in which four periods are considered: 1950-1955, 1980-1985, 2000-2005 and 2020-2025.

Tables 4 and 5 call for the following comments.

The sequence 11-22-33-44 is an approximate description of the overall path of the trajectories since there are many deviations, which

TABLE 19. REDUCTION FROM TOTAL POTENTIAL FECUNDITY OWING TO VARIOUS FACTORS, IN SELECTED COUNTRIES

Country and year	Total fertility rate	Marriage delay	Breast-feeding	Contraception	Other factors	Total fecundity
Sub-Saharan Africa						
Ghana (1979/80)	6.22	2.16	4.31	0.86	3.45	17.00
Kenya (1977/78)	7.40	2.69	4.22	0.67	2.02	17.00
Lesotho (1977)	5.27	3.05	4.34	0.47	3.87	17.00
Senegal (1978)	6.90	1.72	4.65	0.20	3.54	17.01
Sudan, north (1979)	5.93	2.88	3.87	0.44	3.99	17.01
Latin American and Caribbean						
Colombia (1976)	4.27	4.71	1.53	4.20	2.29	17.00
Costa Rica (1976)	3.17	4.70	0.83	6.92	1.52	17.14
Dominican Republic (1975)	5.39	3.72	1.63	3.60	2.55	16.89
Guyana (1975)	4.78	2.93	1.10	3.18	5.01	17.00
Haiti (1977)	5.15	4.38	3.20	1.42	2.84	16.89
Jamaica (1975/76)	4.67	2.59	1.60	4.19	3.95	17.00
Mexico (1976/77)	6.27	3.43	1.82	3.43	2.04	16.99
Panama (1976)	3.84	4.21	1.45	6.71	1.18	17.39
Paraguay (1979)	4.56	4.48	1.99	3.23	2.74	17.00
Peru (1977/78)	5.35	4.66	2.68	2.80	1.51	17.00
Trinidad and Tobago (1977)	3.18	2.90	0.97	4.70	5.25	17.00
Venezuela (1977)	4.36	4.17	1.39	5.06	2.02	17.00
South Asia						
Bangladesh (1975/76)	5.96	1.21	6.84	0.77	2.32	17.10
Nepal (1976)	6.12	1.74	6.09	0.22	2.83	17.00
Pakistan (1975)	6.24	2.26	4.52	0.43	3.55	17.00
Sri Lanka (1975)	3.70	5.05	4.26	2.26	1.73	17.00
East Asia and Pacific						
Fiji (1974)	4.14	3.47	1.67	3.60	4.24	17.12
Indonesia (1976)	4.51	2.62	5.25	2.50	2.12	17.00
Malaysia (1974)	4.62	4.33	0.99	2.97	4.09	17.00
Philippines (1978)	5.12	4.99	2.61	2.97	1.31	17.00
Rep. of Korea (1974)	4.23	4.72	3.32	2.55	2.17	16.99
Thailand (1975)	4.55	3.98	3.86	3.49	1.12	17.00
Middle East and North Africa						
Jordan (1976)	7.63	3.28	2.53	2.62	0.94	17.00
Syrian Arab Republic (1978)	7.46	3.43	2.77	2.10	1.24	17.00

Source: World Bank, *World Development Report 1984* (Oxford, Oxford University Press, 1985).

TABLE 20. STAGES REACHED BY COUNTRIES IN DEMOGRAPHIC TRANSITION

Region and country	1950-1955	1980-1985	2000-2005	2020-2025
Africa	1	2	3	3
East Africa	1	2	3	4
Burundi	2	2	2	4
Comoros	1	1	3	4
Ethiopia	1	1	3	4
Kenya	1	2	3	4
Madagascar	1	2	2	3
Malawi	1	1	3	3
Mauritius	2	4	4	4
Mozambique	1	2	3	4
Réunion	2	4	4	4
Rwanda	1	1	3	3
Somalia	2	2	3	4
Uganda	1	1	3	3
United Republic of Tanzania	1	1	3	3
Zambia	1	2	3	4
Zimbabwe	1	3	4	4
Central Africa	1	2	3	3
Angola	1	1	2	3
Central African Rep.	1	2	2	4
Chad	1	2	2	4
Congo	1	2	3	4
Equatorial Guinea	1	2	3	4
Gabon	1	3	3	4
Cameroon	1	2	3	4
Zaire	1	2	3	4
North Africa	1	3	4	4
Algeria	1	3	4	4
Egypt	1	3	4	4
Libyan Arab Jamahiriya	1	3	4	4
Morocco	1	3	4	4
Sudan	1	2	3	4
Tunisia	1	3	4	4
Southern Africa	1	2	3	4
Botswana	1	2	3	4
Lesotho	1	2	3	4
Namibia	1	2	3	4
South Africa	1	2	3	4
Swaziland	1	2	3	4
West Africa	1	2	3	3
Benin	1	1	2	3
Burkina Faso	1	2	3	3
Cape Verde	1	2	4	4
Gambia	1	1	2	3
Ghana	1	2	3	4
Guinea	1	1	2	3
Guinea-Bissau	1	2	3	4
Côte d'Ivoire	1	2	3	4
Liberia	1	1	2	3
Mali	1	1	2	3
Mauritania	1	1	2	3
Niger	1	1	2	3
Nigeria	1	1	2	3
Senegal	1	1	2	3

TABLE 20 (*continued*)

Region and country	*1950-1955*		*1980-1985*		*2000-2005*		*2020-2025*	
Sierra Leone	1	1	1	1	1	2	2	3
Togo	1	1	2	1	3	2	4	3
Americas	3	2	4	3	4	4	4	4
Latin America	2	2	3	3	4	4	4	4
Caribbean	2	2	3	3	4	4	4	4
Barbados	3	2	4	4	4	4	4	4
Cuba	3	3	4	4	4	4	4	4
Dominican Republic	2	1	3	3	4	4	4	4
Guadeloupe	3	2	4	4	4	4	4	4
Haiti	1	1	2	2	3	2	4	3
Jamaica	3	3	4	3	4	4	4	4
Martinique	3	2	4	4	4	4	4	4
Puerto Rico	3	2	4	4	4	4	4	4
Trinidad and Tobago	3	2	4	4	4	4	4	4
Other Caribbean	3	2	4	4	4	4	4	4
Central America	2	1	3	2	4	4	4	4
Costa Rica	3	1	4	3	4	4	4	4
El Salvador	2	1	3	3	4	3	4	4
Guatemala	1	1	3	1	4	3	4	4
Honduras	1	1	3	1	4	3	4	3
Mexico	2	1	4	2	4	4	4	4
Nicaragua	1	1	3	2	4	3	4	4
Panama	3	2	4	3	4	4	4	4
Temperate South America	3	3	4	3	4	4	4	4
Argentina	3	3	4	3	4	4	4	4
Chile	2	2	4	4	4	4	4	4
Uruguay	4	4	4	4	4	4	4	4
Tropical South America	2	1	3	3	4	4	4	4
Bolivia	1	1	2	1	3	2	4	3
Brazil	2	1	3	3	4	4	4	4
Colombia	2	1	3	3	4	4	4	4
Ecuador	2	1	3	2	4	3	4	4
Guyana	3	1	4	3	4	4	4	4
Paraguay	2	1	4	2	4	3	4	4
Peru	1	1	3	2	4	4	4	4
Suriname	3	1	4	3	4	4	4	4
Venezuela	3	1	4	3	4	4	4	4
North America	4	3	4	4	4	4	4	4
Canada	4	3	4	4	4	4	4	4
United States of America	4	3	4	4	4	4	4	4
Asia	1	2	3	3	4	4	4	4
East Asia	1	2	4	4	4	4	4	4
China	1	1	4	4	4	4	4	4
Japan	3	4	4	4	4	4	4	4
Other East Asia	2	2	4	4	4	4	4	4
Hong Kong	3	3	4	4	4	4	4	4
Korea	2	2	4	3	4	4	4	4
Dem. People's Rep. of Korea	2	2	4	3	4	4	4	4
Rep. of Korea	2	2	4	4	4	4	4	4
Mongolia	2	2	3	2	4	4	4	4
South Asia	1	1	2	2	4	4	4	4
South-Eastern Asia	1	2	3	3	4	4	4	4
Burma	1	2	3	3	4	4	4	4

TABLE 20 (*continued*)

Region and country	*1950-1955*		*1980-1985*		*2000-2005*		*2020-2025*	
Democratic Kampuchea	1	1	1	2	3	4	3	4
East Timor	1	1	1	2	2	3	3	4
Indonesia	1	2	2	3	4	4	4	4
Lao People's Dem. Rep.	1	2	2	2	3	3	4	4
Malaysia	2	1	4	3	4	4	4	4
Philippines	2	1	3	3	4	4	4	4
Singapore	3	1	4	4	4	4	4	4
Thailand	2	1	3	3	4	4	4	4
Viet Nam	1	2	3	3	4	4	4	4
Southern Asia	1	1	2	2	3	4	4	4
Afghanistan	1	1	1	1	2	2	3	4
Bangladesh	1	2	2	1	3	3	3	4
Bhutan	1	1	2	2	3	3	3	4
India	1	1	3	3	4	4	4	4
Iran, Islamic Republic of	2	1	3	2	4	3	4	4
Nepal	1	2	2	1	3	3	3	4
Pakistan	1	1	2	2	3	3	4	4
Sri Lanka	3	2	4	3	4	3	4	4
Western Asia	2	1	3	2	4	4	4	4
Arab countries	1	1	3	1	4	3	4	4
Bahrain	2	1	4	2	4	4	4	4
Democratic Yemen	1	1	2	1	3	3	4	4
Iraq	1	1	3	1	4	3	4	4
Jordan	1	1	3	1	4	2	4	3
Kuwait	3	1	4	1	4	3	4	4
Lebanon	3	2	4	3	4	4	4	4
Oman	1	1	2	1	4	3	4	4
Qatar	2	1	4	1	4	3	4	4
Saudi Arabia	1	1	3	1	4	3	4	4
Syrian Arab Republic	2	1	3	1	4	3	4	4
United Arab Emirates	2	1	4	2	4	3	4	4
Yemen	1	1	2	1	3	2	4	3
Non-Arab countries	2	2	3	3	4	4	4	4
Cyprus	4	3	4	4	4	4	4	4
Israel	4	3	4	3	4	4	4	4
Turkey	2	1	3	3	4	4	4	4
Europe	4	4	4	4	4	4	4	4
Eastern Europe	3	4	4	4	4	4	4	4
Bulgaria	3	4	4	4	4	4	4	4
Czechoslovakia	4	4	4	4	4	4	4	4
German Dem. Rep.	4	4	4	4	4	4	4	4
Hungary	3	4	4	4	4	4	4	4
Poland	3	3	4	4	4	4	4	4
Romania	3	4	4	4	4	4	4	4
Northern Europe	4	4	4	4	4	4	4	4
Denmark	4	4	4	4	4	4	4	4
Finland	4	4	4	4	4	4	4	4
Iceland	4	3	4	4	4	4	4	4
Ireland	4	3	4	3	4	4	4	4
Norway	4	4	4	4	4	4	4	4
Sweden	4	4	4	4	4	4	4	4
United Kingdom of Great Britain and Northern Ireland	4	4	4	4	4	4	4	4

TABLE 20 (*continued*)

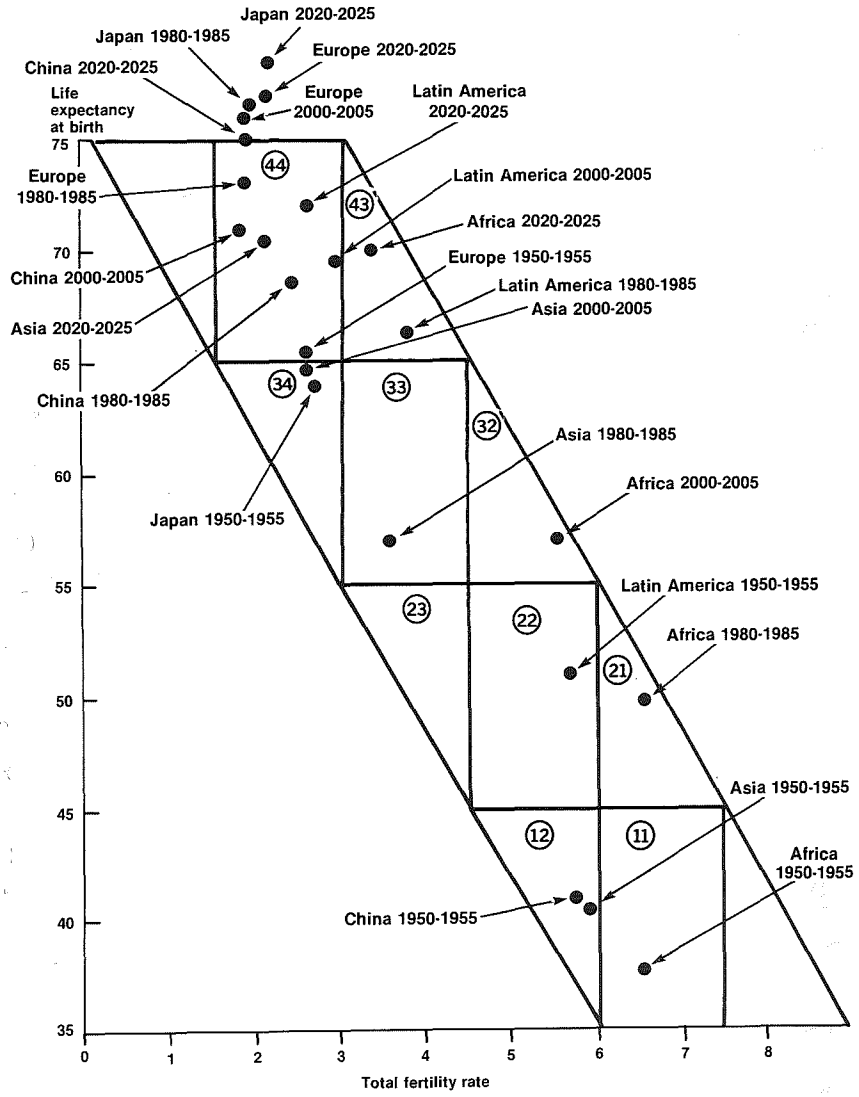
Region and country	*1950-1955*		*1980-1985*		*2000-2005*		*2020-2025*	
Southern Europe	3	4	4	4	4	4	4	4
Albania	3	2	4	3	4	4	4	4
Greece	4	4	4	4	4	4	4	4
Italy	4	4	4	4	4	4	4	4
Malta	4	3	4	4	4	4	4	4
Portugal	3	3	4	4	4	4	4	4
Spain	3	4	4	4	4	4	4	4
Yugoslavia	3	3	4	4	4	4	4	4
Western Europe	4	4	4	4	4	4	4	4
Austria	4	4	4	4	4	4	4	4
Belgium	4	4	4	4	4	4	4	4
France	4	4	4	4	4	4	4	4
Germany, Federal Rep. of	4	4	4	4	4	4	4	4
Luxembourg	4	4	4	4	4	4	4	4
Netherlands	4	3	4	4	4	4	4	4
Switzerland	4	4	4	4	4	4	4	4
Oceania	3	3	4	4	4	4	4	4
Australia-New Zealand	4	3	4	4	4	4	4	4
Australia	4	3	4	4	4	4	4	4
New Zealand	4	3	4	4	4	4	4	4
Melanesia	1	1	3	2	3	3	4	4
Fiji	3	1	4	3	4	4	4	4
Papua New Guinea	1	1	2	2	3	3	4	4
Other Melanesia	2	1	4	2	4	3	4	4
Micronesia-Polynesia	2	1	4	2	4	4	4	4
Micronesia	2	2	3	2	4	4	4	4
Polynesia	3	1	4	2	4	3	4	4
USSR	3	4	4	4	4	4	4	4

NOTE: For the meaning of the figures in this table, see the explanations in tables 4 and 5.

should be pointed out. Those deviations, as already noted, are due to the fact that mortality and fertility rates do not follow a course parallel to that of the model. In some cases, it is the mortality rate that changes more quickly; in other cases, it is the fertility rate. There are also instances where some countries complete the process at an accelerated pace, passing from stage 11 to stage 44, while others mark time in the pre-transition stage or at the beginning of transition.

Many countries had not only begun the transition process as early as 1950-1955, but had even completed it. That was, of course, the case in North America and Northern and Western Europe, where life expectancy at birth exceeded 65 years and the fertility rate was slightly below that required for population replacement. On the other hand, certain countries of Eastern and Southern Europe lagged slightly behind in the transition process as far as their mortality rates were concerned, but that lag had been made up well before 1980-1985. That was the case of Bulgaria, Hungary, Romania and Spain. In 1950-1955, other European countries lagged behind as far as both mortality and fertility rates were concerned, but

Figure X. Transition patterns in the major regions of the world



Source: Table 4.

here, too, they had almost caught up by 1980-1985. That was the case of Poland, Yugoslavia and Portugal. Albania is an exception, since it will take longer to catch up (not before 2020-2025 with regard to fertility rates). Tables 4 and 5 of chapter II give the impression of a trend towards homogeneity among the industrialized countries in terms of similar levels of mortality and fertility. Differences still exist, but they are of secondary importance in an overall view of the present and future world.

It is noteworthy that the countries of Latin America and Western Asia complete the stages of decreased mortality more rapidly than those of decreased fertility, as compared with the general transition model. On the other hand, the Asian countries (excluding those of Western Asia) complete the stages of fertility more rapidly than those of mortality. This phenomenon may be explained by the fact that favourable attitudes towards birth control are being adopted more quickly in Asia as a whole than elsewhere in the third world.

In 1950-1955, Africa as a whole was marked by mortality and fertility rates higher than any ever recorded at the country level, and that situation continued into 1980-1985, with regard to fertility. Up to the end of the period covered by the United Nations projections, Africa has the highest fertility and mortality levels and the highest growth rates. It is striking to note that, between 1950-1955 and 1980-1985, fertility levels rose in many African countries, while they declined elsewhere in the third world. The explanation is to be found in the preceding pages: the factors that tend to increase the supply of children have supplanted the factors that tend to reduce the demand. The exceptions are Mauritius and Réunion, which stand out because they have completed the stages of transition so quickly. In 1950-1955, they were both still at the pre-transition stage with regard to fertility (total fertility rates above 6), but by 1980-1985, they had, in about 30 years, completed the cycle. It is true that in those two countries per capita income is greater than it is in the other African countries and the level of education itself is much higher. In 1980-1985, 16 African countries still remained in pre-transition conditions, or in conditions close to the pre-transition stage (life expectancy at birth lower than 45 years and total fertility rate higher than 6): Burkina Faso, Ethiopia, Malawi, Somalia, Angola, Central African Republic, Chad, Equatorial Guinea, Benin, Gambia, Guinea, Mali, Mauritania, Niger, Senegal and Sierre Leone. The lag of West Africa and East Africa with respect to transition is particularly noteworthy. At the end of the twentieth century, those subregions will still be in the pre-transition stage with regard to fertility (total fertility rate higher than 6); in 2020-2025, they will still be in the third stage of transition (total fertility rate higher than 3 and life expectancy at birth lower than 65 years). The transition process in West Africa will not be completed until the middle of the next century. At the end of the period covered by the United Nations projections (2020-2025), there will be nearly three times as many countries that will not have completed the transition process in Africa (37 countries) as countries that will have completed it (13). The latter include: Comoros, Mauritius, Réunion, Algeria, Egypt, Libyan Arab Jamahiriya, Morocco, Sudan, Tunisia, Lesotho, South Africa, Cape Verde and Côte d'Ivoire. As can be seen, this list contains all the countries of North Africa. The relatively rapid rate of decreased mortality and fertility in that region contrasts strongly with the situation in sub-Saharan Africa.

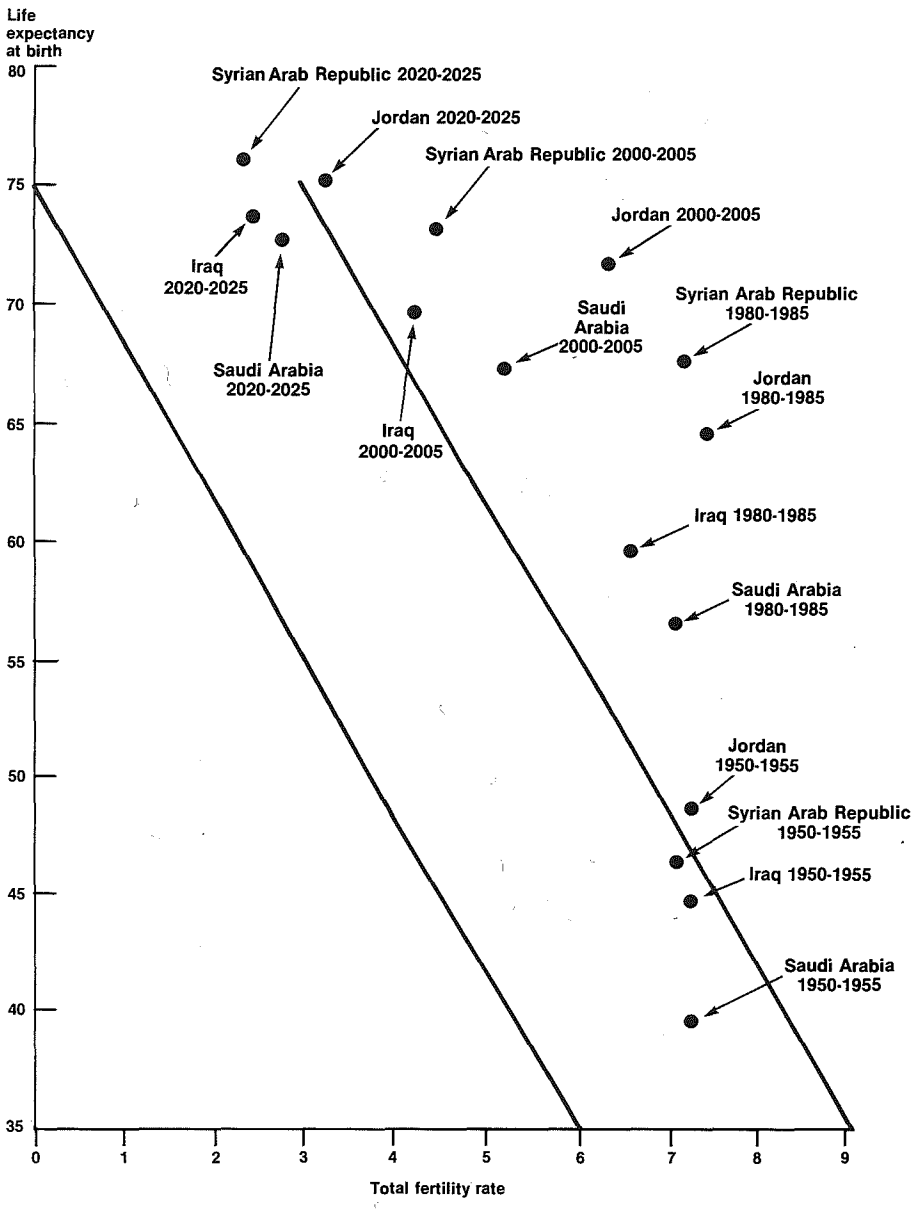
In 1950-1955, the majority of Latin American countries had entered the second stage of transition (rectangle 22 of figure X): life expectancy at

birth reached 51.0 years and the total fertility rate was slightly lower than 6. When that situation is compared with that of Europe when the latter had the same average life expectancy, that is, right after the First World War, one notices how high the fertility level in Latin America was in 1950-1955 as compared to the fertility level in Europe just before the 1920s (the total fertility rate was then between 2.5 and 4). Latin America should complete the entire transition process towards the end of this century, a little later with regard to fertility and a little earlier with regard to mortality. The countries that will show a lag with regard to mortality are: Haiti, Honduras, Bolivia and Ecuador; those that will lag behind with regard to fertility are: El Salvador, Guatemala, Mexico, Nicaragua, Colombia, Paraguay, Peru and Venezuela. Among the subregions of Latin America, the differences in the rates of progress are quite pronounced. At the two extremes one finds, on the one hand, tropical South America, which in 1950-1955 had barely left the pre-transition stage with regard to mortality (life expectancy at birth, 50.2 years) and was at the pre-transition stage with regard to fertility (total fertility rate higher than 6); on the other hand, there is temperate South America, which during the same period was already in the third stage of transition as regards both mortality (life expectancy, 60.2 years) and fertility (total fertility rate, 3.52). Between those two extremes is the Caribbean region, which in 1980-1985 entered the third stage of transition (life expectancy, 64.2 and total fertility rate, 3.34).

Tables 4 and 5 of chapter II suggest two interesting observations with regard to Asia as a whole. First, the transition process has been quite rapid: by 1980-1985, it apparently had already reached the penultimate stage (life expectancy between 55 and 65 years and total fertility rate between 3 and 4.5). Secondly, and in contrast with Latin America, where, as has been noted, the drop in fertility lagged slightly behind the drop in mortality, Asia is unique in the third world in that fertility levels change more quickly than mortality levels. That becomes clear in the following figures: for the period 2000-2005, life expectancy at birth is projected at 70.2 years for Latin America and 68.1 years for Asia and the total fertility rate is expected to reach 2.73 in Latin America as compared to 2.32 in Asia.

China and Japan stand out from the other Asian countries, China because it is passing so quickly through the stages of transition, and Japan because it had almost reached the last stage (life expectancy at 63.9 years and total fertility rate at 2.77) as far back as 1950-1955. Japan now has the lowest mortality rate in the world. In figure X, the paths of transition followed by China and Japan are highlighted because of their uniqueness. Several smaller Asian countries come close to China with regard to their speed of transition. Those countries are the Republic of Korea, Singapore and, to a lesser degree, Malaysia, Sri Lanka and the Philippines. Thailand is also passing rapidly through the stages of transition; United Nations projections already predict that, in the light of recent trends, by the end of the century, the situation in Thailand will be comparable to that of China today.

Figure XI. Transition in Arab countries



Source: Table 4.

In contrast with those countries, four large Asian countries—India, Indonesia, Pakistan and Bangladesh—are slow in their passage through the stages of transition. The lag is especially pronounced with regard to mortality. Greater lags are expected in the following countries: Afghanistan, Democratic Kampuchea, East Timor, Bhutan and Nepal.

The countries of Western Asia, whose populations are primarily Arab, stand out from the rest of Asia because of their relatively rapid drop in mortality and a pronounced lag in the drop in fertility. In Bahrain, Iraq, Jordan, Kuwait, Qatar, Saudi Arabia, the Syrian Arab Republic and the United Arab Emirates, mortality levels since 1980-1985 have been close to those normally found at the end of the transition period (life expectancy at and above 65 years), whereas fertility levels are those normally found during the pre-transition period or the next period (total fertility rate often still above 6). The points representing that subregion in figure XI are outside the diagonals. On the other hand, the non-Arab countries of Western Asia (Cyprus, Israel and Turkey) are making a relatively rapid progress with regard to both fertility and mortality levels.

IV. THE INDUSTRIALIZED COUNTRIES

While the demographic trend observed over the past two decades in the third world is almost certainly irreversible, at least for a long time to come, with, of course, occasional unpredictable deviations, we do not perceive too clearly the direction that the demographic curves of the industrialized countries will take.

These countries have experienced a shift in cultural values, which has had a definite impact on demographic behaviour, with respect to both the formation of families and family fertility. Never before in modern history has there been such rejection of marriage as an institution, so many *de facto* unions and "trial marriages", illegitimate births and pre-nuptial conceptions, so many single-parent families or such high divorce rates, but above all never has fertility dropped so low, to the point where some authors actually speak of a veritable collapse of reproductive behaviour in the wealthy countries. The contrast with the fertility of the third-world countries is as marked now as it was just after the Second World War, when the population problem of the developing world was first raised.

One cannot help but think that the trends found in the demographic components are interlinked in a new family cycle and are themselves linked to the general direction taken by society.

Let us take a closer look at the situation.

First observation. Synchronous movements are both extensive and widespread

In the industrialized world, as we have said, there is an incredible rethinking of family mores related to forms of social life that are themselves evolving. The most striking fact is that the trends regarding marriage and the family are common to all the industrialized countries whether they are in Northern, Southern or Western Europe, North America or Oceania, or even, more surprisingly, whether they have market economies or planned economies. The novelty is that the changes relating to the nuptiality and fertility of couples should be so extensive and so widespread.

In 30 out of 34 industrialized countries, fertility rates have slipped below the population replacement point. However, population figures are still rising in most countries because of the accumulation over time of a "growth potential" in age-specific structures that are still relatively "inflated" by past fertility, or because of immigration. Only four countries are above the population replacement level: Ireland, Iceland, Poland and the USSR, but these countries are on a declining curve.

It is surprising that the cut-off point marking the end of the baby boom falls with remarkable precision in Europe around the year 1964, and somewhat earlier in the United States and the USSR.

Europe shows the same synchronism when it comes to changes in age at first marriage and in the increase of divorces and also when it comes to fertility.

Second observation. The drop in fertility is part of a long secular decline

The drop in fertility in the industrialized countries is not an entirely new phenomenon. Actually, the decline began about 200 years ago in France and about 100 years ago in the other industrialized countries, with incidental variations such as the marked drop during the Great Depression of 1932-1935 and the post-War baby boom.

This is not the first time that fertility rates have fallen below the population replacement level. Rather sharp deviations from the secular trend were occasioned by the major global economic and social shifts, downwards at the time of the Great Depression, upwards during the period of relative economic and social abundance during the years 1944-1974 (the "glorious 30", as the French say). The total fertility rate had fallen to 1.58 in Germany in 1933, to 1.70 in Sweden in 1934, to 1.72 in the United Kingdom of Great Britain and Northern Ireland in 1933, to 2.02 in France in 1936 and to 2.18 in the United States in 1936 (see table 21 and figure XII for the trends since the beginning of the century by quinquennial periods). It would seem that the Second World War temporarily interrupted the secular downward trend.

With hindsight, it appears that the baby boom of the post-War years was more than a simple tendency to recuperate births deferred during the War or the result of more relaxed contraceptive practices. The baby boom, in fact, lasted longer than a simple recuperative tendency. It would seem that the recuperation was in a way amplified by the favourable economic and social conditions that developed at the time, combined with the almost total absence of unemployment and with the establishment of social security systems, which had been in an embryonic stage before the War and which created a new climate of collective solidarity. It should be remembered that this was the period when family allowance systems, medical insurance, retirement schemes and unemployment funds were everywhere being set up or improved.

The baby boom was most marked in the United States, as can be seen from figure XII. In fact, that country gave us the expression "baby boom". The total fertility rate reached 3.60, the highest figure for the post-War years in any industrialized country, except Ireland and Iceland.

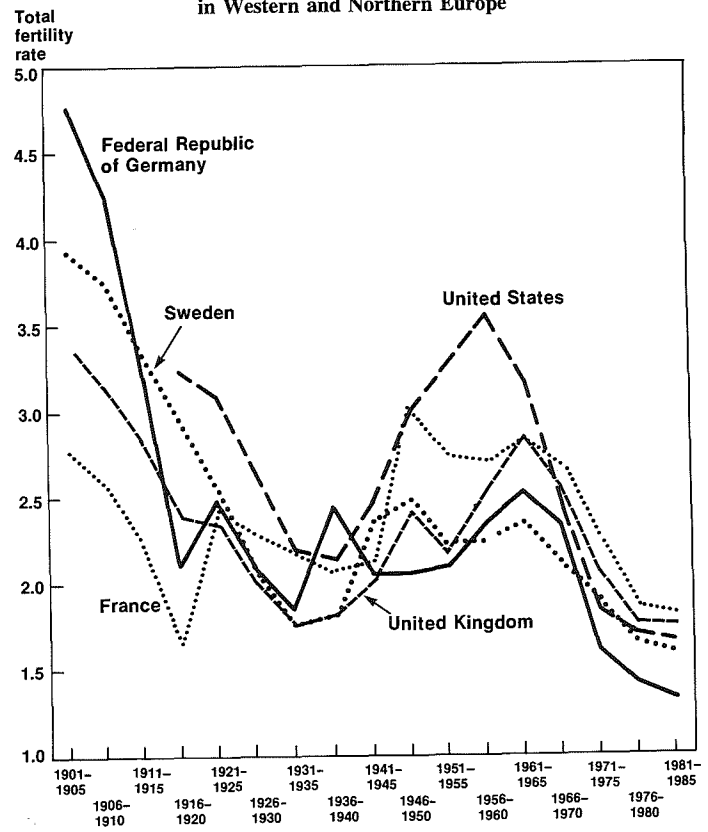
It was also the United States that signalled the return to the secular fertility trend, around 1960. In 1975, the rate in the United States had reverted to 1.77, or a reduction by half in 17 years. Since then, the rate has been fluctuating around 1.8, with no specific direction.

TABLE 21. TOTAL FERTILITY RATE OF SOME INDUSTRIALIZED COUNTRIES

	Finland	*Norway*	*Denmark*	*Sweden*	*United Kingdom*	*France*	*Italy*	*Portugal*	*Spain*	*German (FR and GDR)*	*Netherlands*	*Switzerland*	*United States*
1901-1905	4.22	4.13	4.04	3.91	3.40	2.78	. .	. .	. .	4.74	4.48	3.82	. .
1906-1910	4.15	3.86	3.83	3.76	3.14	2.59	. .	. .	. .	4.25	4.15	3.56	. .
1911-1915	3.68	3.60	3.44	3.31	2.84	2.26	. .	. .	. .	3.19	3.79	3.02	. .
1916-1920	3.49	3.43	3.15	2.94	2.40	1.66	. .	. .	. .	2.13	3.58	2.46	3.22
1921-1925	3.33	3.00	2.85	2.58	2.39	2.43	. .	. .	3.96	2.49	3.47	2.43	3.08
1926-1930	2.88	2.32	2.41	2.08	2.01	2.29	. .	. .	3.75	2.05	3.08	2.10	2.65
1931-1935	2.41	1.92	2.15	1.77	1.79	2.18	3.06	3.88	3.50	1.86	2.73	1.91	2.21
1936-1940	2.38	1.86	2.17	1.82	1.80	2.07	3.00	3.45	2.76	2.43	2.58	1.80	2.14
1941-1945	2.60	2.20	2.64	2.35	2.00	2.11	2.56	3.43	2.73	2.05	2.85	2.38	2.45
1946-1950	2.86	2.62	2.75	2.45	2.38	2.99	2.78	3.29	2.68	2.05	3.48	2.52	2.97
1951-1955	2.99	2.64	2.55	2.23	2.19	2.73	2.30	3.05	2.53	2.09	3.05	2.30	3.27
1956-1960	2.78	2.86	2.54	2.24	2.52	2.70	2.32	3.02	2.76	2.34	3.11	2.40	3.53
1961-1965	2.58	2.94	2.59	2.33	2.83	2.83	2.56	3.10	2.88	2.50	3.15	2.61	3.16
1966-1970	2.06	2.73	2.20	2.12	2.56	2.60	2.50	2.91	2.89	2.33	2.74	2.29	2.41
1971-1975	1.62	2.24	1.96	1.89	2.06	2.26	2.31	2.64	2.83	1.62	1.99	1.82	1.84
1976-1980	1.67	1.77	1.65	1.66	1.76	1.88	1.88	2.32	2.50	1.41	1.59	1.51	1.69
1981-1985	1.74	1.66	1.38	1.61	1.75	1.82	1.53	1.97	1.87	1.32	1.47	1.50	1.66

Source: J. Bourgeois-Pichat, "Comparative fertility trends in Europe", in *Causes and Consequences of Non-Replacement Fertility* (Hoover Institution, 7-9 November 1985).

Figure XII. Total fertility rate trends in selected countries in Western and Northern Europe



Source: Table 21.

The country hardest hit by the drop in fertility was the Federal Republic of Germany, where the rate fell to the incredibly low figure—in the view of those who were following the demographic situation—of 1.25, which is the greatest decline on record in the industrialized countries, even in wartime. In 1941-1946, as can be seen in table 21, the European rates were holding at around 2 births per woman. The latest figure is even lower than the record at the low point of the Great Depression, when the rate fell to 1.58 in 1933. There was considerable unemployment then, whereas at the time the baby boom had run its course, around 1965, unemployment in the Federal Republic of Germany was among the lowest in Europe. Still today, the unemployment rate is well below what it was at the beginning of the 1930s. Other figures give a good idea of the force of the declining trend. In 1964, the last year of the baby boom, there were 1.1 million births in the Federal Republic of Germany. In 1984, the figure is only half that. It is not difficult to imagine the consequences of that plummeting drop on the economy, especially on the school system, employment and the pension system. It has been calculated that, if the pattern were to persist, there would be only just over one employed person

TABLE 22. TOTAL FERTILITY RATE IN THE INDUSTRIALIZED COUNTRIES

Country	*1965*	*1970*	*1975*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*
Austria	2.68	2.30	1.83	1.60	1.65	1.67	1.66	1.56	1.54
Belgium	2.60	2.24	1.73	1.69	1.69	1.67	1.60	1.56	1.56
Denmark	2.61	1.95	1.92	1.60	1.55	1.44	1.43	1.38	1.40
England-Wales	2.85	2.42	1.80	1.86	1.90	1.81	1.76	1.75	1.75
Finland	2.47	1.83	1.68	1.64	1.63	1.64	1.72	1.74	. .
France	2.84	2.47	1.93	1.85	1.94	1.91	1.79	1.81	1.81
Germany, Fed. Rep. of	2.50	2.01	1.45	1.38	1.45	1.43	1.41	1.32	1.27
Iceland	3.71	2.79	2.65	2.49	2.48	2.33	2.26	2.24	. .
Ireland	4.03	3.87	3.41	3.23	3.23	3.07	2.96	2.74	. .
Luxembourg	2.41	1.96	1.63	1.47	1.51	1.53	1.49	1.45	. .
Netherlands	3.04	2.58	1.60	1.56	1.60	1.56	1.49	1.47	. .
Northern Ireland	. .	3.13	2.63	2.74	2.72	2.54	2.47	2.42	. .
Norway	2.93	2.50	1.98	1.75	1.72	1.70	1.71	1.65	1.65
Scotland	3.00	2.57	1.91	1.85	1.84	1.86	1.73	1.70	1.68
Sweden	2.42	1.92	1.77	1.66	1.68	1.63	1.62	1.61	1.61
Switzerland	2.61	2.10	1.61	1.52	1.55	1.54	1.55	1.51	1.52
United Kingdom	2.83	2.44	1.82	1.88	1.92	1.84	1.78	1.77	. .
Greece	2.32	2.43	2.33	2.29	2.21	2.09	2.02	1.94	1.85
Italy	2.55	2.37	2.19	1.74	1.66	1.57	1.57	1.53	1.50
Portugal	3.07	2.62	2.59	2.17	2.14	2.04	2.02	1.96	. .
Spain	2.97	2.87	2.80	2.31	2.16	1.99	1.87	1.71	. .
Yugoslavia	2.71	2.29	2.27	2.12	1.23	2.06	. .	. .	. .
Bulgaria	2.03	2.18	2.23	2.15	2.05	2.01	2.02	2.00	. .
Czechoslovakia	2.37	2.07	2.43	2.33	2.16	2.10	2.10	2.07	2.09
German Dem. Rep.	2.48	2.19	1.54	1.90	1.94	1.85	1.85	1.79	. .
Hungary	1.82	1.96	2.35	2.01	1.91	1.88	1.79	1.72	. .
Poland	2.52	2.20	2.27	2.25	2.26	2.22	2.31	2.40	. .
Romania	1.91	2.89	2.60	2.48	2.43	2.37	2.17	2.00	. .
Union of Soviet Socialist Republics	2.46	2.39	2.41	2.28	2.26	2.25	2.29	2.37	. .
Canada	3.15	2.33	1.90	1.76	1.75	1.70	1.69	1.67	1.67
United States	2.93	2.48	1.77	1.80	1.82	1.81	1.81	1.75	. .
Australia	2.97	2.85	2.14	1.90	1.89	1.93	1.93	1.93	1.56
New Zealand	2.53	3.17	2.36	2.12	2.03	2.01	1.95	1.92	. .
Japan	2.14	2.13	1.89	1.74	1.73	1.71	1.75	. .	. .
Israel	3.99	3.97	3.67	3.21	3.14	3.06	3.12	3.14	. .

Source: A. Monnier. "La conjoncture démographique", *Population,* vol. 40, No. 4-5 (July-October 1985), pp. 750-763.

per retiree in the Federal Republic of Germany around the beginning of the next century.

The Southern European countries with a Catholic majority, where the populations have long been considered to favour high fertility, have not remained outside the trend. Italy, where the total fertility rate stands at 1.53, has one of the lowest rates in Europe (see table 22). In the northern and central regions, the rate fell in 1983 to 1.28, close to that of the Federal Republic of Germany. The rate for the whole of Italy has for the first time dropped well below that of France, where, as in the United States, the rate has been fluctuating around 1.8 for about 10 years. Portugal, Spain and Greece have fertility rates close to that of France but their rates have declined from much higher post-War levels.

Another country whose high birth rate seemed anchored in tradition is the Netherlands. Its fertility rate fell sharply, from 3.15 in 1961-1965 to 1.47 in 1981-1985, a fall of almost 50 per cent in 20 years. In the process, the declining trend did away with the formerly marked differences between religious groups.

The first to cross the replacement rate barrier were the countries of Northern and Western Europe, between 1971 and 1975, followed by the Mediterranean countries.

The drop in fertility seems to have been the result of a decline in the number of children desired and was made possible by more effective contraception, whereas the pre-War drop had been achieved almost entirely through traditional contraceptive methods and abortions and, as we have seen, was not so marked.

Birth control is now available to all couples.[23] The time is long past when clandestine abortion, more widespread than was believed, was shrouded in silence and was a fearful experience and a cruel trial, especially for the poorest women. A choice of methods now allows women to avoid undesired child-bearing, by means of either liberalized abortion or modern contraceptive methods, the pill being utilized by 40 to 50 per cent of women practising contraception and intra-uterine devices by more than 10 per cent of the women in many countries; or by means of sterilization, which in some countries is reaching high rates of frequency (37 per cent of married couples in the United States, 41 per cent in Canada, 30 per cent in New Zealand, 20 per cent in the Netherlands, as against only 4 per cent in Japan, 4.1 per cent in France, 4.9 per cent in Poland and so on).

From the point of view of family composition, a new pattern for the timing of family events has begun to emerge with the decline in fertility.[24] Family size is shrinking. The number of childless women has increased, while the number of families with more than two children is declining steadily. The prevailing notion of the large family has itself changed. Formerly, the term was used for families with at least five children. Today, it is used for families with more than two children. The declining birth rate has been brought about, above all, by the decrease in third and higher-order births rather than in first and second births. Indeed, when

Governments want to raise the birth rate, they focus their efforts on the third child.

It is surprising to note once again the parallelism throughout the European countries in how the age at childbearing has varied. A lowering of that age was first observed in the case of the generations of mothers born in the early 1940s, followed by a reversal and a raising of that age in the case of generations of mothers born after 1950.

Another phenomenon common to the industrialized countries is the increase in illegitimate births. This increase has been obvious since 1976-1977 in almost all the market economy countries, as can be seen in table 23. In 1984, the proportion of illegitimate births was 41.9 per cent in Denmark, 44.6 per cent in Sweden, 21.5 per cent in Austria, 17.8 per cent in France and 17.3 per cent in the United Kingdom. By contrast, in 1970 the proportion was below 20 per cent in the Scandinavian countries and below 10 per cent in Western and Southern Europe.

It appears that, since 1980, fertility in the industrialized countries has been declining less rapidly, or has stabilized or, perhaps, even increased slightly. But it is still too soon to make predictions about the solidity of that stabilization or increase. In any case, the United Nations has been working on that assumption. The assumption is that the return to population replacement in the industrialized countries will come about gradually, at different times in different countries, between the last years of this century and the beginning of the next. Indeed, demographers acknowledge that the socio-economic factors underlying fertility trends are in many ways still mysterious and no one can say whether these factors will still be present in the coming decades. But the United Nations, in preparing world-wide projections, had no choice but to make assumptions for the industrialized countries as it had done for the developing countries.

It should be noted that the baby boom, which, as we have seen, delayed the aging of the population by altering for a rather long time the declining trend of the fertility curve, eased the burden of pensions for at least two decades.

Third observation. The situation in the industrialized socialist countries is generally not very different from that in the market economy countries

In the aftermath of the War, fertility rates in the European socialist countries did not evolve in the same way as in the market economy countries. At that time, legislation on abortion and contraception played a decisive part in variations in fertility rates. Legislation in that area was liberal and caused such a sharp decline in fertility rates that measures were subsequently adopted to reverse the trend, starting in 1966 in Bulgaria, Hungary and Romania, and in 1974 in the German Democratic Republic.

These measures fell into two categories. The first consisted of incentives in the form of a wide range of family benefits, such as allowances in

TABLE 23. ILLEGITIMATE BIRTHS PER 100 LIVE BIRTHS IN SELECTED EUROPEAN COUNTRIES

Country	*1970*	*1975*	*1976*	*1977*	*1978*	*1979*	*1980*	*1981*	*1982*	*1983*	*1984*
Austria	12.8	13.5	13.8	14.2	14.8	16.5	17.8	19.4	21.6	22.4	21.5
Denmark	11.0	21.6	23.9	25.7	27.7	30.5	33.2	35.7	38.3	40.6	41.9
France	6.8	8.5	8.5	8.7	9.3	10.2	11.4	12.7	14.2	15.9	17.8
Germany, Fed. Rep. of	5.5	6.1	6.3	6.5	7.0	7.1	7.6	7.9	8.5	8.8	9.1
Netherlands	2.1	2.1	2.5	2.7	3.1	3.4	4.1	4.8	5.9	7.0	7.7
Sweden	18.4	32.4	33.2	35.4	35.9	37.6	39.7	41.2	42.0	43.6	44.6
Switzerland	3.8	3.7	3.8	3.9	4.1	4.4	4.7	5.1	5.5	5.4	5.7
United Kingdom	8.3	9.1	9.2	9.7	10.2	10.9	11.8	12.8	14.4	15.8	17.3

Source: F. Muñoz-Perez. "Changements récents de la fécondité en Europe occidentale et nouveaux traits de la formation des familles", *Population*, vol. 41, No. 3 (May-June 1986) pp. 447-462.

cash for women who decided to stay at home to look after newborn children, or housing facilities; this was especially true in Czechoslovakia and in the German Democratic Republic. The second category consisted of restrictive measures, in the form of sometimes strict limitations on legal abortions before the birth of the third or fourth child. However, three countries, namely, the USSR, Poland and the German Democratic Republic, maintained a measure of liberalism with regard to abortion. It is interesting to note that, despite this, Poland and the USSR have the highest fertility rates among the socialist countries and that the fertility rate in the German Democratic Republic has increased significantly since 1975. Admittedly, it had previously declined to a low level, and was still lower than in the other countries of that group in 1983.

The measures adopted to increase the birth rates were sophisticated and rapidly produced results. The rates increased markedly. Between 1965 and 1975, the total fertility rate increased from 1.82 to 2.35 in Hungary, from 1.91 to 2.60 in Romania and from 2.03 to 2.33 in Bulgaria. In the German Democratic Republic, the rate declined from 2.48 to 1.54 during the same period, that is, almost to the same rate as in the Federal Republic of Germany. It was, in fact, at that time that the authorities took action to remedy the situation by introducing incentives, which proved to be effective, and the rate rose to 1.79 in 1983.

Judging by the results achieved, the measures adopted by the European socialist countries to stimulate the birth rate appear to have not only checked the decline, but actually reversed the trend. The most obvious and best-known illustration of that success is provided by Romania, where the fertility rate increased from 1.91 in 1965 to 2.89 in 1970, following the prohibition of abortion.

However, the increase in fertility rates had begun to slacken by 1979, probably reflecting the transient nature of the upturn, and the latest figures, although they generally point to higher fertility rates than in the market economy countries, are still generally below the replacement level. Only two countries are above that level—the USSR (2.37) and Poland (2.40). In Romania, the rate declined from 2.60 in 1975 to 2 in 1983; in Czechoslovakia, from 2.43 to 2.07 and in Hungary, from 2.35 to 1.72.

It should be pointed out that the fertility rate in the USSR is strongly influenced by the urban-rural distribution of the population, as well as its ethnic distribution. Among the urban population, the total fertility rate is 1.88, as against 3.34 in the rural areas. In terms of ethnic distribution, the group of republics of Central Asia and Azerbaijan, which has a high fertility rate, is distinct from the group of European republics. In the first group, which comprises a high proportion of rural population, fertility rates were well above 3 and even 4 in 1975-1978 (5.01 in Tadzhikistan, 4.54 in Kirghizia, 4.4 in Uzbekistan, 4.93 in Turkmenistan, 3.5 in Kazakhstan and 3.22 in Azerbaijan), and therefore quite similar to those of the Islamic developing countries. In the second group, the rate varies between 1.76 in the Russian Soviet Federated Socialist Republic and 2.71 in Armenia. Of course, such sharply differential fertility rates are causing imbalanced population growth among the various nationalities.[25]

Fourth observation. Marriage is becoming less frequent, is being postponed and is more fragile

Conventional marriage, although it may not yet be obsolete, clearly appears to be losing ground throughout the wealthy countries. Premarital sexual experience no longer scandalizes anyone. "Trial marriage" has been largely accepted by population groups which have become almost essentially urban, and among which that form of union goes almost unnoticed. There are fewer marriages and people are marrying later in life. Legally contracted unions are almost outnumbered by *de facto* unions, which are sometimes legalized eventually, following the birth of a child. This has the effect of postponing marriage and blurring statistics on the birth order of children born in wedlock. There can be little doubt that the feeling of uncertainty prevailing among young people, especially the difficulty in finding employment, is not conducive to marriage and the assumption of family responsibilities.

The decline in the number of marriages and their postponement is accompanied by a rapid increase in divorce rates and a consequent reduction of the average duration of marriage.

These trends are developing in almost perfect symmetry.

The so-called total first-marriage rate, that is, the sum total of age-specific rates of first marriage in a given year, which provides a good indication of marriage frequency, has declined in market economy and planned economy countries alike. The average decline is about 30 per cent. In actual fact, the trend began around 1965, at the end of the baby boom, and appears to have originated in the Scandinavian countries, especially in Denmark and Sweden. It subsequently spread to Western and Southern Europe at the beginning of the 1970s and to Eastern Europe around 1975. In Denmark and Sweden, the rate fell below 0.5, to half of what it had been around 1968. In other words, if age-specific marriage rates remain at their present levels, slightly more than half the men and women in those two countries will be single at the age of 50. At present, the percentage of unmarried men and women in that age group is still smaller because the downward trend is relatively recent. For the time being, however, it is only when we consider marriages contracted around 1960 that the proportion of single men and women is approximately 50 per cent. Between 1982 and 1984, the total first-marriage rate declined to between 0.5 and 0.6 in France, the Netherlands, Norway and the Federal Republic of Germany, between 0.6 and 0.7 in Austria, Belgium, Spain, Finland, the United Kingdom and Switzerland, and between 0.7 and 0.8 in Italy, Hungary and the German Democratic Republic. The rate is declining but still above 0.8 in Bulgaria, Poland and Czechoslovakia. In Romania, however, it is still close to 1.

There are also similarities among the industrialized countries in terms of age at marriage. A slight decline between 1965 and 1970 was followed by a strong increase owing to the postponement of marriage. In Denmark, for example, between 1965 and 1970, the average age at which men married for the first time was about 25; in 1984, it was 28.4. For women, the average age increased from 22.5 to almost 26.

The same similarities can be observed in respect of divorce. The number of marriages ending in divorce increased considerably in all countries, especially after 1968-1970. Thus, the waning popularity of marriage is reflected not only in the declining number of marriages and in higher age at marriage but also in the high incidence of marriage breakdowns and the fact that such breakdowns are occurring at an increasingly early stage, thereby steadily reducing the duration of the broken marriages.

The total divorce rate, which is the sum total of divorce rates classified by duration of marriage, has been rapidly increasing (see table 24). In Denmark, the rate was 0.45 in 1984. This implies that, if the divorce rates classified by marriage duration recorded in 1984 remain at that level, 45 per cent of all marriages would end in divorce. For the time being, however, the proportion of divorced couples is still below that percentage because the increase in divorces is still recent. In Sweden, the rate is roughly the same. It is somewhat lower in the United Kingdom (0.4) and in Austria, France, the Federal Republic of Germany and Switzerland (0.3). The same trend is affecting the countries of Eastern Europe, where the rate is approximately 0.3. In the USSR, it is 0.36, that is, almost as high as in the United States.

The average duration of the marriages ending in divorce has been declining steadily, from between 12 and 15 years around 1970 to slightly less than 10 years.

TABLE 24. TOTAL DIVORCE RATE (MULTIPLIED BY 100)

Country	*1965*	*1970*	*1975*	*1979*	*1980*	*1981*	*1982*	*1983*
Austria	14.5	18.2	19.7	25.3	26.2	26.5	28.6	27.8
Germany, Fed. Rep. of	. .	. .	23.4	18.5	22.7	24.8	27.3	. .
Belgium	8.2	9.6	16.1	19.4	20.0	22.6	22.3	. .
Denmark	18.2	25.1	36.7	37.6	39.3	43.1	43.9	45.1
Finland	13.7	17.1	25.8	29.3	27.3	27.9	28.8	29.3
France	10.7	12.0	17.2	24.3	24.7	. .	. .	. .
Norway	10.2	13.4	20.7	24.8	25.1	27.2	27.6	30.0
Netherlands	7.2	11.0	20.0	23.5	25.5	28.6	. .	. .
England-Wales	10.7	16.2	32.2	36.5	39.3	38.8	. .	. .
Scotland	5.9	10.3	18.3	21.5	25.6	24.3	28.1	33.1
Sweden	17.8	23.4	49.9	42.3	42.2	43.5	. .	. .
Switzerland	12.7	15.5	20.9	25.7	27.3	28.1	29.6	30.2
German Democratic Rep.	. .	. .	28.8	32.3	. .	. .	. .	. .
Bulgaria	10.3	14.8	15.4	16.8	18.5	18.8	18.8	20.1
Hungary	22.7	25.0	27.7	28.9	29.4	29.3	31.0	32.4
Poland	. .	14.6	15.4	13.8	13.6	13.4	15.9	. .
Romania	20.4	4.8	20.2	20.9	. .	. .	. .	. .
Czechoslovakia	16.8	21.8	27.8	25.3	26.6	27.1	27.4	29.1
USSR	14.9	26.1	29.8	38.8	37.4	37.0	35.8	. .

Source: J.-P. Sardon, "Evolution de la nuptialité et de la divorcialité en Europe depuis la fin des années 1960", *Population*, vol. 41, No. 3 (May-June 1986), pp. 463-482.

It is easy to imagine the extent to which the family life cycle in the wealthier countries has been disrupted by these new marriage, birth and divorce patterns.

Fifth observation. Mortality rates are undergoing the same process of general decline and alignment as is affecting the formation of families

Mortality rates in the industrialized countries continued to decline significantly in the past decades, considering that life expectancy was already relatively high. For a long time it had been believed that progress in this area would become slower because of its increasing cost, as life expectancy gradually reached 70 years and infant mortality fell below 10 per thousand—a limit beyond which further advances were believed to be virtually impossible. Yet, rates of 7 to 9 per thousand have already been recorded in the Scandinavian countries. Survival until the first birthday has become a near certainty in those countries, where the rate is about 99 per cent, and it can be assumed that the same rate of survival will soon prevail throughout the industrialized countries. Although infant mortality still accounts for a high proportion of overall mortality in the developing countries, it has been reduced to a minute fraction in the wealthier countries.

Overall mortality rates are declining in all countries, especially in those where life expectancy was formerly the lowest, thereby reducing disparities. Two extreme examples are Norway and Portugal, where life expectancy (for both sexes) in 1950-1955 was 72.7 and 59.3 years respectively, that is, a difference of 13.4 years. By 1980-1985, the figures were 76 and 71.7 years, the gap being reduced to 4.3 years. Life expectancy throughout the industrialized countries is at least 70 years. The average is 73.1 years and most of the figures are near that average.

Although the limits of human life are unknown, recent progress in life expectancy and breakthroughs in geriatrics have led many authors to advance optimistic theories on trends in life expectancy over the next few decades, and a figure of about 100 has been suggested as a plausible forecast.

The most striking progress has been achieved in Japan, where life expectancy at birth increased by 13 years between 1950-1955 and 1980-1985, thereby putting Japan in the lead, with a life expectancy of 76.9 years (79.7 years for women and 74.3 years for men), although Japan was at the bottom of the list at the beginning of the period. The age of 80, which had long been considered a biological limit, has virtually been reached by women already.

The struggle to postpone death in the wealthy countries has brought about a change in the role of medicine, and generally in the entire medical and social system. Indeed, the system tends to maintain a certain quality of life, ensuring that people who suffer from incurable diseases are kept in good condition without excessive pain, by relying on increasingly costly methods. Each additional year of life expectancy is achieved at the cost of

a larger allocation to the health and social services budgets in national accounts.

An analysis of the evolution of the structure of causes of death, classified by sex and by age group, has become complicated, and all that can be presented here is a simplified outline of the situation. Infectious diseases are gradually disappearing completely and account for only 1 per cent of deaths. At present, cardio-vascular diseases and cancer are the main causes of death.

To a large extent, the increase in life expectancy is attributable to the decline in mortality associated with cardio-vascular diseases, especially coronary diseases. Yet, these are still by far the main cause of death among men over the ages of 35 or 40, followed by cancer in the age group above 40. Among women, however, cancer is the main cause of death between the ages of 25 and 60, and circulatory diseases after the age of 60.

The reduction in the number of deaths caused by coronary disease is particularly noteworthy. This trend appears to be attributable, on the one hand, to improved medical care, especially as a result of progress in the treatment of high blood pressure and, on the other hand, to healthier life-styles, which prevent or delay the contraction of fatal forms of the disease, including a lower consumption of saturated fats and cigarettes and more physical exercise. There has been a reaction against the living conditions characteristic of affluent societies.

Cancer, for its part, is responsible for more than one fifth of the deaths recorded among men and slightly less than that among women. Variations from one country to another are considerable, the lowest rate being recorded in Japan and the highest in Denmark. The forms of cancer that cause the most deaths are those affecting the lungs, the respiratory-digestive system (larynx, pharynx, oesophagus), the stomach, the intestines, the breasts (women) and the prostate gland (men). Risk factors are associated with occupations and life-styles (eating habits, alcohol and tobacco consumption). Women's cancers appear easier to detect than those affecting men.

Lastly, it should be pointed out that the pattern of mortality rates by social category has, in relative terms, remained largely unchanged, at least in the rich countries. Although mortality rates have declined in all the social categories, the relative disparities between them have remained roughly the same. In other words, although disparities in mortality rates among the industrialized countries have been reduced, the same cannot be said of the disparities between the various social categories within those countries.

Sixth observation. Aging: a problem common to all industrialized countries

If any problem can be considered unavoidable in the industrialized countries, it is the problem of aging, resulting from lower fertility, which

narrows the base of the age pyramid, and from a decline in mortality, which broadens its peak: The problem will inexorably worsen and the industrialized countries will be faced with an unprecedented aging process.

The effects of fertility changes on the age structure are profound and slow to disappear. They spread through the entire age profile like ripples passing through the body of a serpent that has swallowed a hare. All age groups are affected by these ripples: first children, then adults and finally the elderly. The effects of the decline in fertility are compounded by the decline in mortality, which tends to expand the older age groups (see table 25).

TABLE 25. AGE STRUCTURE IN THE INDUSTRIALIZED COUNTRIES
(Percentage)

	0-14	*15-24*	*25-59*	*60 and over*
1950	27.8	17.2	43.7	11.4
1960	28.6	15.2	43.6	12.5
1970	26.5	16.7	42.5	14.3
1980	23.0	16.9	44.8	15.2
1985	22.2	15.9	46.1	15.8
1990	21.7	14.6	46.8	16.8
2000	20.8	13.7	47.1	18.4
2010	20.0	13.4	46.8	19.7
2025	19.7	12.9	43.8	23.6

Source: United Nations, "Global trends and prospects of aging population structures", *Economic and Social Implications of Population Aging: Proceedings of the International Symposium on Population Structure and Development, Tokyo, 10-12 September 1986* (ST/ESA/SER.R/85).

This process has been going on for a long time. The decline in fertility began at least a century ago in the industrialized countries, and two centuries ago in France, as mentioned earlier. It picked up speed when fertility dropped to a low point during the Depression, slowed down as a result of the post-War baby boom, which pushed fertility rates up, and finally accelerated again as a result of the swing back to low fertility rates in 1965.

In theory, the process can be reversed if the population is sufficiently "replenished" by an upturn in births. In practice, fertility has been falling for such a long time in the industrialized countries and its decline is so great that the population cannot be rejuvenated, thus preventing an increase in the proportion of elderly, unless the increase in the birth rate is extremely high (by a speedy return to a fertility rate of about 2.4 to 2.5) and sustained, especially since the drop in mortality figures is likely to continue.

The phenomenon of aging is subject to a "see-saw effect", with the proportion of children declining when that of the elderly increases.

The proportion of children 0-14 years of age is declining. In Europe, it went from 25.4 per cent in 1950 to 20.9 per cent in 1985 and should

decline still further, to 18.5 per cent, by 2025. In North America, the proportion, which was 27.2 per cent in 1950 and 21.9 per cent in 1985, will probably drop to 20.1 per cent in 2025. This reduction will result in lower social costs (family allowances, school costs and welfare and health expenses), but will be more than offset by the increased spending brought about by an increase in the aged population, since an elderly unemployed person is more costly than his youthful counterpart.

The proportion of the economically active population (25-59 years) is expected to increase between 1980 and 2000 as the baby-boom generations reach working age. But after the beginning of the twenty-first century, in all countries except Ireland, where fertility has declined only slightly, this proportion will be gradually reduced by the moving up of smaller generations born after 1970. The most striking example is the Federal Republic of Germany, where the proportion of persons between 15 and 64 years of age will go from 66.3 per cent in 1980 to 67.6 per cent in 2000 and 61.8 per cent in 2025. In 2025, in almost all countries, the economically active population will be smaller than in 1980.

Projections also show that the decline in the ratio of persons 25-59 years of age to persons 60 years and over will start out slowly, because the baby boom will increase the numbers of older people of working age, but will accelerate around the period of 2000-2025, which, according to estimates, in the turning point at which the baby-boom generations will reach retirement age and the working population will be smaller because of the subsequent drop in fertility.

The ratio of persons aged 25-59 to those 60 and over, which in many countries is close to 3, is likely to decline at a faster rate after 2005 and to reach approximately 1.5 in 2035. In the Federal Republic of Germany, the ratio was 3.04 in 1980 and will probably drop to 1.59 as early as 2025. Moreover, a comparison of the working and non-working populations shows that in 2025 the Federal Republic of Germany will have almost as many pensioners as contributors to pension funds.

The working population will tend to become older and comprise more women. The percentage of working people between 45 and 64 years of age will increase compared to the working population between 15 and 64, and more women will participate in the work force.

Finally, from an economic point of view, the aging of the population will change consumption patterns, in particular in the medical area. In future, retirement schemes will have to adopt measures to preserve the purchasing power of retired persons (by pushing back the age at retirement, increasing contributions during working years etc.).

V. AFRICA: A SLOW TRANSITIONAL PROCESS

A. THE SOCIO-ECONOMIC CONTEXT

Africa, a continent of some 550 million inhabitants, or 11 per cent of the current world population, and one which according to United Nations projections could have over 1.6 billion inhabitants as early as 2025, or 20 per cent of the projected world population, is distinct from the rich countries from the demographic and economic points of view, but it is also distinct from the other major regions of the third world. All factors converge to make the African continent the world's poorest and most prolific relation. Many authors claim that the two characteristics are related in one way or other. Some say that sluggish development leads to uncontrolled demographic growth, while others say that the high rate of demographic growth contributes to slow development, although it is not the sole cause.

It is in that region of the world, with the most rapid population growth ever recorded for a continent and the most pronounced backwardness, that the controversy assumes its full dimensions.

First of all, countries in Africa have only recently become independent. Some observers are surprised, quite wrongly, that the Africans have not been able to complete their development efforts in just over one generation, whereas the rich countries devoted centuries to that task. Independence had led to a partitioning of countries whose frontiers often artificially bisect ethnic groups, some simply along a straight line. Africa is divided into 50 States, which is a higher figure than in Asia, with 39 countries for a population almost six times as large, and than in Latin America, with 29 countries for a population of 406 million. Africa is a kaleidoscope of some 800 ethnic groups with very diverse behaviours, which are sometimes quite unrelated to the political boundaries.

It is often said that Africa is a relatively empty continent, with a density of 18 persons per square kilometre (see table 26), which is close to Latin America's figure of 30 but much lower than the Asian figure of 102. The two major densely populated zones are the forest belt of West Africa and the north-south line of the East African mountain range. On the high plateaux of Kenya, for example, which are fertile areas with good rainfall, the population density is above 300 per square kilometre. But large arid areas are uninhabited and uninhabitable, for example, the Sahel or the humid forest region of Central Africa. Between these two extremes, some lands have a larger and others a smaller population than warranted by the environmental conditions. More than elsewhere in the third world, soil quality and healthiness of the climate play an essential role in the pattern of settlement.

TABLE 26. AFRICA. DENSITY PER KM² 1980-1985 AND IN 2020-2025

	1980-1985	2020-2025		1980-1985	2020-2025
Algeria	9	24	Madagascar	17	51
Angola	7	20	Malawi	59	196
Benin	36	108	Mali	6	17
Botswana	2	7	Mauritania	2	6
Burkina Faso	25	71	Mauritius	514	786
Burundi	166	397	Morocco	53	134
Cameroon	20	53	Mozambique	18	50
Cape Verde	80	113	Namibia	2	5
Central African Rep.	4	11	Niger	5	15
Chad	4	10	Nigeria	103	366
Comoros	210	496	Réunion	224	329
Congo	5	15	Rwanda	232	841
Egypt	47	97	Senegal	33	96
Equatorial Guinea	14	33	Sierra Leone	50	109
Ethiopia	30	92	Somalia	9	21
Gabon	4	12	South Africa	27	63
Gambia	57	133	Sudan	9	22
Ghana	57	158	Swaziland	37	112
Guinea	22	57	Togo	52	161
Guinea-Bissau	25	59	Tunisia	44	83
Côte d'Ivoire	30	87	Uganda	67	222
Kenya	35	142	United Republic of Tanzania	24	89
Lesotho	50	134	Zaire	14	45
Liberia	20	61	Zambia	9	32
Libyan Arab Jamahiriya	2	6	Zimbabwe	22	84
			TOTAL	18	54

Source: Calculated by the author.

If United Nations estimates are accurate, in 2025, Africa will have a density close to that of Asia today: 88 per square kilometre. The most densely populated areas are in Nigeria (103), Burundi (116), the Comoros (210), Réunion (224), Rwanda (232) and Mauritius (514). On the basis of United Nations projections, in 2025, the density will be 786 in Mauritius, 841 in Rwanda and 366 in Nigeria. It thus seems that in a few decades it will no longer be possible to describe Africa as an "empty continent". Admittedly, these projections exclude migrations and the projected figures refer to the populations of today's survivors and their descendants who are themselves survivors. These calculations suggest that the above-mentioned countries will experience strong demographic pressure which will necessarily cause emigration. Oil-rich Nigeria, which is currently a country with net immigration although at times immigrants are sent back, will in 2025 have a density almost equal to that of the Netherlands today (355).

Admittedly, the region has more land available and to be developed than the other major regions of the third world. Experts agree that it has considerable agricultural potential. But it is also a region where traditional agricultural practices require more land per inhabitant to obtain the same results, in particular compared with Asia, where there are generally better opportunities for irrigation and more frequent double harvests. The expan-

sion of cultivated areas in Africa also poses some environmental problems which are more difficult to sidestep than elsewhere, in particular sleeping sickness, which makes raising livestock unfeasible on many lands, at least with the technological methods currently used to combat the tsetse fly. Calculations on the carrying capacity of African land made by experts of the Food and Agriculture Organization of the United Nations (FAO) indicate that the continent could theoretically feed several times the current population, even in the rather distant future when, for example, according to United Nations estimates, the population will have tripled by 2025. However, as FAO itself has recognized, these calculations assume that a number of obstacles will have been overcome, whether they are economic (large investments that are for the time being difficult to make because of the international financial climate), political (migrations between countries with land of varying degrees of fertility), ecological (the use of insecticides against the tsetse fly has adverse effects on the environment), social (inadequate levels of education and health, which are the legacy of a long colonial past, although a long time has elapsed since Africa's early days of independence and many countries have highly skilled specialists, economic planners, agricultural engineers, etc.) or demographic (record growth rate). The benefits of the green revolution have thus far been more apparent in Asia and Latin America than on the African continent.

Africa's economic situation has steadily deteriorated over the past two decades. During the 1960s, the annual growth rate of per capita production was slightly above 3 per cent, or approximately half a point higher than the population growth rate. Since the early 1970s, the production and population curves have intersected, with population rising above production. Average per capita income is less than $500 in the countries south of the Sahara and in half of them it is half that amount. Among the 34 countries classified by the World Bank as "low-income" countries, 24, or half, of the African countries are listed.

The continent's external debt of about $175 billion is like a Sisyphean punishment: year after year, debt servicing outstrips amortization, and external factors exacerbate the process (recurring weather-related disasters, erratic changes in the raw-materials market).

While in the other major regions of the third world advances in food production, in particular as a result of the green revolution and a reduction in the population growth rate, have enabled the food production growth rate during the period 1978-1980 to equal or exceed population growth rates, the opposite has occurred in Africa. According to FAO and the World Bank, the difference between the two rates was apparently −1.1 per cent in Africa, as compared to 0.6 per cent in Latin America, 1.4 per cent in South-Eastern Asia (excluding China), zero in Southern Asia and 0.2 per cent in the Middle East. Africa will probably have a stagnant subsistence economy until it manages to produce the foodstuffs that it consumes. Whereas in 1960, Africa was self-sufficient with regard to food, which did not mean that there was no malnutrition or undernourishment, in the early 1980s it depended on imports for 14 per cent of its food needs. It has gradually become dependent on the outside world

and on food aid for its supplies. With 1960 as the base year (100), the food production index fell to 95 in 1976, 89 in 1982 and again fell by 2 points in 1983 and 1984.

Analysing longer-term forecasts, the Executive Secretary of the Economic Commission for Africa concluded in March 1984 that, at the rate things were going, African production would meet only 71 per cent of food needs in 2008.

From the budgetary point of view, because the school-age population has grown rapidly and school enrolment figures have lagged behind, expenditure on education absorbs 30 to 40 per cent of the budget in many countries, and it is expected that spending on primary education will double by the end of the century. Health costs, currently about $5 per person per year, are also expected to double over the next two decades.

More openly formulated and implemented population policies, as called for by the Second African Population Conference, held at Arusha in January 1984, are part of a series of internal measures without which Africa's development will be indefinitely delayed.

B. Main demographic features

The salient demographic features of the African continent and the causes of an evolution in population growth are set out briefly below.

1. *Population growth*

As pointed out, the population growth in Africa is the most rapid ever registered on any continent and will probably never be seen again. Africa has broken the all-time record for demographic growth set by Latin America in the period 1960-1965 (2.8 per cent). The growth rate on that continent has since declined, falling to 2.3 per cent in 1980-1985, whereas in Africa it is expected to continue to climb, from 2.95 per cent in 1980-1985 to 3.13 per cent in 1995-2000; it should start to fall thereafter, but only very slowly.

The African population has gone from 224 million in 1950 to 555 million in 1985 and is expected to reach 877 million by 2000, that is, a figure considerably higher than that for India in 1985 (759 million). The estimated population for 2025 is 1,617 million, a total well above that predicted for China, which Africa will overtake in the year 2020 with a projected 1,468 million inhabitants compared with China's 1,436 million. But whereas the population of China is expected to start stabilizing at that point, that will hardly be the case with Africa.

Hence, in 75 years, from 1950 to 2025, the population of Africa will probably increase 7.2 times, and between 1950 and 2050, that is, in the space of a century, it might even increase tenfold.

2. *Regional differences*

Birth rate and mortality variations between subregions are not as great in Africa as in Asia and Latin America. Such pronounced differences as those between China and Bangladesh or tropical and temperate South America, for example, are not encountered there. Table 27 shows that, for all intents and purposes, the birth rate of all five subregions of Africa attains or surpasses 40 per thousand. In East and West Africa, it is nearly 50 per thousand, with total fertility rates approaching 7, and in Southern Africa, it is just under 40 per thousand, with a fertility rate of 5.21. Variations in mortality rates are somewhat greater, because hygiene has improved more rapidly in North Africa than in the countries south of the Sahara.

The subregions with the fastest growth are West and East Africa. In the case of the former, the growth rate is expected to increase to 3.35 per cent in 1995-2000 and should reach 3.30 per cent for the latter by the same date. However, these are composite statistics and a country such as Kenya, which has relatively reliable demographic statistics, already has an estimated growth rate of 4.12 per cent, an all-time world record and a figure that might even increase to 4.21 per cent in 1990-1995, again according to United Nations projections.

North Africa as a whole has never attained a rate of 3 per cent because of Egypt, which brought down the average rate. The combined population of the three Maghreb countries (Algeria, Tunisia and Morocco) in 1950 (before independence) was exactly half that of France, whereas in 1985 their total population had virtually caught up, and in 2025, it will be more than twice as great. Clearly, a connection exists between these figures and the presence of approximately 2 million immigrants from those countries in France today.

3. *Fertility*

The reason the growth rate in Africa is so high is that, while mortality has begun to decrease, fertility has remained stable or has even increased. As has often been pointed out, the drop in fertility and mortality is due to a number of common factors, but for the time being such factors have had the opposite effect. The list of countries in which fertility has remained stable or increased between 1950-1955 and 1980-1985 appears in table 28.

It can be seen that virtually all the African countries are included. The only exceptions are Mauritius and Réunion, where special conditions exist because of the per capita income (about $1,000 or more) and the educational levels there, and some other countries, where the drop in fertility was slight. The phenomenon is all the more remarkable because it is rarely observed in Asia (only in the Lao People's Democratic Republic, Afghanistan, Bangladesh, Nepal, Jordan, the Syrian Arab Republic and Yemen) and is practically unknown, although for completely different reasons, in Latin America (only in Argentina and Uruguay). The reason is

TABLE 27. SALIENT DEMOGRAPHIC FEATURES OF THE SUBREGIONS OF AFRICA, 1980-1985

Region	*Population in 1985 (in millions)*	*Birth rate (per thousand)*	*Death rate (per thousand)*	*Growth rate (percentage)*	*Total fertility rate*	*Life expectancy at birth*	*Infant mortality rate (per thousand)*	*Population in 2000 (in millions)*	*Population in 2025 (in millions)*
East Africa	166 404	49.4	18.3	3.10	6.82	43.3	120	272 244	536 859
Central Africa	59 538	44.7	17.7	2.71	6.02	47.8	117	91 996	169 597
North Africa	122 960	39.3	12.3	2.64	5.55	56.5	100	175 563	260 767
Southern Africa	37 218	39.6	14.2	2.54	5.21	53.0	87	54 553	90 991
West Africa	168 808	49.2	18.3	3.18	6.86	47.2	123	277 461	558 302
	554 928	45.9	16.6	2.92	6.34	49.4	112	871 817	1 616 515

Source: World Population Prospects. Estimates and Projections as Assessed in 1984 (United Nations publication, Sales No. E.86.XIII.3).
NOTE: The population figures for 2000 and 2025 are United Nations projections based on the medium variant.

TABLE 28. COUNTRIES IN WHICH FERTILITY HAS BEEN STABLE OR HAS INCREASED BETWEEN 1950-1955 AND 1980-1985
(Total fertility rate)

Region and country	*1950-1955*	*1980-1985*
East Africa		
Burundi	5.44	6.44
Comoros	6.27	6.29
Ethiopia	6.70	6.09
Madagascar	5.70	6.09
Malawi	6.78	7.00
Mozambique	5.42	6.09
Rwanda	5.97	7.30
Somalia	6.60	6.60
Zambia	6.59	6.76
Central Africa		
Angola	6.39	6.39
Cameroon	5.76	5.79
Central African Republic	5.52	5.89
Chad	5.77	5.89
Congo	5.69	5.99
Equatorial Guinea	5.50	5.66
Gabon	4.06	4.51
Zaire	5.98	6.09
North Africa		
Libyan Arab Jamahiriya	6.87	7.17
Southern Africa		
Botswana	6.27	6.50
Namibia	5.87	6.09
Swaziland	5.96	6.50
West Africa		
Benin	6.74	7.00
Côte d'Ivoire	6.65	6.70
Gambia	5.87	6.39
Ghana	6.37	6.50
Guinea-Bissau	5.05	5.38
Liberia	6.22	6.90
Mali	6.36	6.70
Mauritania	6.71	6.90
Niger	6.86	7.10
Sierra Leone	6.12	6.13
Latin America		
Argentina	3.16	3.38
Uruguay	2.73	2.76
South-Eastern Asia		
Lao People's Democratic Republic	5.75	5.84
South Asia		
Afghanistan	6.70	6.90
Bangladesh	5.72	6.15
Nepal	5.64	6.25
Western Asia		
Jordan	7.17	7.38
Syrian Arab Republic	7.09	7.17
Yemen	6.97	6.97

Source: World Population Prospects. Estimates and Projections as Assessed in 1984 (United Nations publication, Sales No. E.86.XIII.3).

that in Africa factors tending to increase the birth rate (improved hygiene for women, decrease in temporary female sterility in connection with the rejection of breast-feeding, less post-partum sexual abstinence) have had a greater effect than those tending to reduce it, which have been virtually non-existent (little change in nuptiality, so that mothers are still very young when their first child is born). In addition, such factors as the low level of school attendance and the economic value of children in the family, in particular in a rural setting, the unchanged status of women, the unavailability of family planning and the belated awareness on the part of the authorities of the effects of rapid demographic growth, continue to act as a powerful stimulus to having children.

Table 17 gives examples of the duration of breast-feeding and the resulting amenorrhoea for several countries. In almost all African countries, the duration of amenorrhoea is between 10 and 20 months. The duration of post-partum abstinence is difficult to measure. According to surveys conducted in West and Central Africa, it varied between 10 and 19 months in Ghana, 11 and 22 months in Cameroon and 11 and 15 months in Zaire.

One particular and paradoxical phenomenon worth noting is the relatively high sterility of women in Africa, especially in the countries of Central Africa (Gabon, Congo, Zaire, Cameroon and the Central African Republic), which appears to be the result of sexually transmissible diseases (gonorrhoea and syphilis) and abortion (see table 29). Presumably, measures to prevent and treat these problems will help to increase the fertility of women, thereby increasing the number of births.[26]

Owing to the above-mentioned factors, contraception in Africa, particularly south of the Sahara, is practically unknown, in marked contrast with most Asian countries (except in Western Asia) and with Latin America. North Africa is almost the only region where modern contraceptive methods (i.e., the pill, the intra-uterine device, condom, injections, sterilization) are relatively prevalent: 25 per cent of married women in Tunisia, 23 per cent in Egypt and 17 per cent in Morocco. Algeria started later, because for a long time the authorities there were less in favour of family planning.

Mention should be made of an experiment in Morocco, in which a programme of comprehensive house calls employs mobile teams that visit families to administer vaccinations, treat diarrhoea, in particular by providing oral rehydration salts, promote breast-feeding, give advice on family planning and distribute contraceptives. The programme has already shown results; the rate of prevalence of contraception rose from 12 per cent in 1978 to 25.5 per cent in 1984. Admittedly, the programme has been more of a success in urban settings, where the rising level of education creates a favourable terrain, but efforts have now been extended to rural areas too, where house calls are almost easier to make than in towns.

In Africa south of the Sahara, the level of prevalence of contraception rarely exceeds 10 per cent, and then only in certain big cities

TABLE 29. STERILITY IN AFRICA

Country	Percentage of women without children at the end of the reproductive period	Fertility deficit owing to sterility (births per woman)
Angola	11.5	0.9
Burkina Faso	5.9	0.3
Cameroon	17.2	1.6
Central African Republic	17.3	1.6
Chad	11.0	0.9
Congo	20.5	1.9
Côte d'Ivoire	9.9	0.8
Gabon	32.0	3.2
Guinea	6.0	0.3
Mali	7.7	0.5
Mozambique	13.8	1.2
Niger	8.9	0.6
Senegal	4.0	0.1
Sudan	8.7	0.6
United Republic of Tanzania	11.4	0.9
Zaire	20.5	1.9
Zambia	14.0	1.2
WEIGHTED AVERAGE	12.1	1.0

Source: O. Frank, "L'infécondité en Afrique au sud du Sahara: évaluations et conséquences", *Perspectives internationales du planning familial,* numéro spécial (1983), pp. 8-11.

(Nairobi, Accra and, perhaps, Lagos), and users are almost exclusively from the most highly educated segment of the population. An interesting exception is Zimbabwe, where, according to a recent survey, the level of prevalence has reached 27 per cent. However, that country is unusual because it has a relatively high per capita income (approximately $750) in comparison with the other sub-Saharan countries and also a high level of education. Two factors have encouraged the adoption of family planning in Zimbabwe: first, the favourable attitude on the part of the authorities and, secondly, the existence of non-governmental women's organizations which, as in Morocco, have anticipated the needs of the population with house calls to teach women about birth control methods. If this information is confirmed, it would appear that the United Nations demographic projections for Zimbabwe should be revised downwards.

Although illegal in most African countries, rudimentary abortions seem to be widespread and are usually conducted in unhygienic conditions. Little is known about their frequency, but the number of hospitalizations in gynecology wards because of abortion-related complications gives an idea of their prevalence. Abortions appear to be increasing rapidly among young girls. According to surveys conducted in cities in Zaire and Ghana, almost half the women below the age of 20 have had one or more abortions. This phenomenon is said to be partially responsible for the high maternal mortality in Africa.

It should be pointed out that the availability of family planning continues to be inadequate in Africa, even though the demand is still small.

But experience has shown that the mere presence of such centres is a powerful stimulus to requests for services. In those few localities that have centres, the use of contraception has grown rapidly, which proves that a latent demand does exist in Africa and would make itself felt if it had the chance.

In the six surveys analysed by R. Lesthaeghe,[27] it was observed that many women are still ignorant of both modern and traditional forms of contraception: 66 per cent in Cameroon, 49 per cent in northern Sudan, 40 per cent in Senegal, 35 per cent in Lesotho, 31 per cent in Ghana and 12 per cent in Kenya.

In North Africa and Southern Africa the signs of a decline in high fertility rates are seen most clearly. By the end of the present century, the total fertility rate in these two subregions should be about four births per woman, whereas in West, East and Central Africa it should be between five and six births. In the latter subregions the signs of a decrease in fertility are still quite faint and could be offset by the continued drop in mortality, however slow. In the countries where the World Fertility Survey was conducted (Benin, Cameroon, Côte d'Ivoire, Ghana, Kenya, Lesotho, Mauritania, Nigeria, Senegal and Sudan), between 1977 and 1982, the replies given by women to questions on desired family size indicated an average of 6 in Ghana and Lesotho, 8 in Cameroon, 8.9 in Senegal and 8.8 in Mauritania for women between the ages of 45 and 49. Admittedly, the lowest figures were given by the youngest women (15 to 19 years), but they still exceeded 8 in Mauritania, Nigeria and Senegal. In none of the countries surveyed was the figure below 5. These are signs that the situation is changing a little more rapidly in East Africa and, to some extent, in Central Africa, than in West Africa. In the former, age at marriage has begun to rise at the same time as the increase in school attendance, while in the latter, marriage continues to occur at an early age, post-partum sexual abstinence is observed to a greater extent and polygamy is more frequent. The United Nations fertility projections take account of these differing trends.

In North Africa, according to various surveys, the desired family size is much smaller, between 4.1 and 5.2, clearly indicating a forthcoming decline in fertility. All this confirms the assumptions of fertility changes adopted by the United Nations for the African countries, that is, a slower change in the south Sahara and a relatively faster one in the north. As there is clearly a close relation between desired family size and the level of education of women, presumably fertility will actually decline as levels of education increase. However, it must be expected that there will be a lag between the time when the level of education increases sufficiently and the time when fertility declines.

4. *Nuptiality*

With regard to nuptiality, it should be noted that, in Africa, unions are unstable, more so than in the other major areas of the third world, including Latin America. Celibacy is virtually non-existent in Africa.

Everyone, or nearly everyone, marries at some time or another. Divorce occurs frequently, sterility being a primary cause; persons remarry almost immediately, whether the marriage or remarriage takes the form of a monogamous or polygamous union. A woman may have lived in several types of union. Isolation, so frequent in the industrialized countries, does not exist in Africa among young or old, women or men. Women marry for the first time at a young age, between 15 and 20, but closer to 15 than 20, and the average difference in age with the husband varies between 4 and 11 years. In the six countries mentioned above (Cameroon, Sudan, Senegal, Ghana, Kenya, Lesotho), because of the combination of a high mortality rate and a considerable age difference between spouses, 20 per cent of the women are widowed after the first marriage. Since, in addition, the divorce rate is about 20 per cent, the result is that 40 per cent of the women in marriages end in widowhood or divorce. Often these women are still young and they nearly always remarry. It has been calculated that the time spent outside a union represents only 10 per cent of the fertile period. Presumably, the incipient increase in life expectancy and the smaller difference in age between the spouses will result in widowhood being less of a reason for a reduction in fertility. This is one of the factors involved in the trend towards an increase in the number of children at the beginning of the demographic transition in Africa.

Attention should be drawn to a phenomenon also found in other third-world countries, particularly in India. Women who have become grandmothers avoid being mothers again, although they may still be fertile since they married at an early age.

The frequency of pre-marital births varies from country to country. They are quite frequent in Cameroon (21 per cent) and Kenya (23 per cent) and relatively rare in Ghana (5.7 per cent), Senegal (2.8 per cent) and Lesotho (4.5 per cent).

In connection with nuptiality in Africa, the question of polygamy naturally arises, since Africa is the region where it is most widespread, to such an extent that a demographer has to think, in the case of certain African populations, in terms of the fertility of women rather than in terms of the fertility of couples. R. Lesthaege has noted an average of 45 per cent of women living in polygamous situations in countries in the western and central parts of the Sahel, 31 per cent in countries in Central and West Africa and 25 per cent in East Africa.

With regard to polygamy, there are two questions that arise and that have been discussed by several authors, recently by G. Pison.[28] Is the fertility of women married to a polygamist lower than that of women living in a monogamous situation, as might initially be expected in populations not practising birth control? If the reply is in the affirmative, to what extent does polygamy reduce the fertility of a population where it is sufficiently widespread? The replies to these two questions are not simple, for many factors are involved. Pison replies to the first question in the affirmative, but with many provisos. Women who live in a polygamous system breast-feed longer than other women and can observe the rule of

post-partum abstinence more easily, but there is a selective element involved, since they sometimes belong to that type of union because of their sterility. When they are found to be sterile, the husband takes another wife while still keeping them. Furthermore, it is difficult to make a distinction between women in a monogamous and a polygamous union, since many women living polygamously might have lived previously in a monogamous union. In fact, in a survey carried out in southern Togo,[29] women married in a polygamous system had only slightly fewer children than women married in a monogamous union. The effect, if there is one, is therefore slight. Surveys carried out in other populations confirm these results. Pison therefore replies to the second question in the negative: polygamous populations are not less fertile than monogamous populations and the main reason is that the demographic conditions associated with polygamy are rather conducive to somewhat higher fertility. In such populations, permanent celibacy is even less frequent, age at marriage is earlier and the remarriage of widows and divorced women is virtually automatic. In addition, polygamy could not disappear suddenly, as desired by some African Governments, without disrupting the marriage market. Thus, for purely demographic reasons, which it would take too long to explain here, its disappearance can occur only through a slow and gradual process.

5. *Mortality*

Despite the lack of demographic statistics for many African countries, especially of mortality statistics since this area has not until now been the subject of as many surveys and as much research as fertility, it may be said that tangible progress has been made, varying widely from one subregion to another and one country to another. The improvement of maternal and child welfare services, vaccinations, continuous supervision of pregnancies and the improvement in the educational level of women, however slow, have all helped to reduce infant mortality. Basic health policy is developing rapidly, and this is undoubtedly a sign of progress in the economic, ecological and socio-cultural context of Africa.

For Africa as a whole, the increase in life expectancy at birth has supposedly been 11.6 years over a period of 30 years: from 37.8 in 1950-1955 to 49.4 in 1980-1985. This is less than in Latin America, where over the same period life expectancy rose from 51.1 to 64.2 years, that is, an increase of 13.1, and much less than in Asia, where life expectancy rose from 41.2 to 59.1 years, or an increase of 17.9, with China having contributed substantially to this progress. However, it is far from negligible, although disappointing since Africa began with a low level in 1950 and progress is generally observed to be more rapid at the lower life expectancy levels than at the higher. The third-world countries are catching up, while the wealthy countries are advancing into the unknown, as it were. Europe, for example, gained slightly less than eight years over the same period and will most probably progress no more than 3.5 years over the next 30 years, if we are to believe the United Nations forecasts. These are, perhaps, slightly too conservative, no doubt because projections for

these countries have to be made without benefit of precedents. Gaining a year of life expectancy in the third world means battling the poverty which that region has always known, whereas gaining a year of life expectancy in the wealthy countries means advancing into unchartered areas through new and costly medical techniques. Naturally, this does not mean that it is easier to make progress in a known area, lacking the means to avoid obstacles, than to venture into the unknown with good equipment. The reverse is currently the case: the transfer of medical technologies is difficult, not only because of the high cost of these technologies but also, and more important, because of their unsuitability to entirely different economic and socio-cultural contexts.

There is little doubt that it will be a long time before Africa catches up to the health level not only of the wealthy countries but also of Latin America and even of Asia, where, however, progress is slower in lowering mortality than fertility.

In the various subregions of Africa, roughly the same life expectancy patterns as fertility patterns are found. The regions where fertility is declining most markedly are also those that make better progress on the health front. As can be seen from table 27, there are marked differences between North Africa and Southern Africa, on the one hand, and Central Africa, West Africa and East Africa, which have the lowest life expectancy levels, on the other.

Infant mortality fell sharply in Africa between 1950-1955 and 1980-1985, as can be seen from table 27, but the levels are generally still quite high and have an adverse effect on life expectancy. Malnutrition is considered to be responsible for between one third and two thirds of child deaths. In 1980-1985, 21 countries out of 50 still had an infant mortality rate higher than 120 per thousand and were therefore below the target set by the World Population Conference held at Bucharest in 1974, which stipulated that countries with high mortality rates should aim at an infant mortality rate lower than 120 per thousand in 1985. This list consists mainly of Central and West African countries.

Based on data collected in the World Fertility Survey, the following variations have been shown for infant mortality in Africa:

(*a*) Probability of death is high for the first born, diminishing with each birth and then returning to high levels (seven or more births);

(*b*) Probability of death is high at the extreme ages of maternal fertility. It is particularly high among children born to women under 20 years of age—even higher than among children born to women over 40 years of age;

(*c*) The shorter the interval between the child's birth and the previous birth, the higher the probability of the child's death. The risk is approximately twice as high when the interval is less than 24 months as when it is 47 months or longer.

These findings are, of course, not restricted to Africa, but they appear to be more relevant to that continent.

First, the high child mortality (1 to 4 years) appears to be partly due to the disease kwashiorkor, a form of protein and calorie insufficiency leading to a loss of weight masked by oedema (retention of water in the tissues). The sight of these African children with their spindly legs and pot bellies is all too frequent in television newscasts on hunger in Africa. The disease is usually contracted when the child is weaned, after breast-feeding stops, and is aggravated by infections such as measles. It often occurs when the mother becomes pregnant again after she stops breast-feeding. In fact, the word kwashiorkor, in the African vernacular, means "condition of the preceding child when a new child appears".

Another feature specific to Africa is the high rate of maternal mortality during pregnancy and childbirth. The sparse figures available on this subject show that the maternal mortality rate is about 4 per thousand women of reproductive age, or 20 to 40 times the rate currently observed in the industrialized countries. Risk of maternal mortality appears particularly high among young mothers, among those over 30 and among those who have already had a large number of births. Here, again, the phenomenon is not specific to Africa, but it is more marked there than anywhere else where it has been measured.

6. *Geographical distribution*

Significant changes are expected in the ratio of the urban to the rural population in Africa. While the continent was characterized in 1950 by its small urban population compared with the other major developing regions, the high rate of urban growth, owing both to natural increase and to migratory movement towards the cities, brought the region into second position in 1985 with respect to urbanization, surpassing Asia but lagging far behind Latin America. In 1950, Africa's urbanization rate was 14.8 per cent, whereas the rate for Latin America was 52.5 per cent and for Asia 16.9 per cent. In 1985, the rates were 32.1, 68.9 and 28.2 per cent respectively. For the end of this century, the projected rates are 42.2, 76.6 and 35.7 per cent respectively.

However, it is the volume of the African urban phenomenon that is really spectacular. In 1950, the urban population was 32.9 million. In 1985 it was 177 million, or nearly a sixfold increase in 35 years. According to United Nations forecasts, the urban population of Africa should reach 958 million in 2025, or exactly 30 times larger in the space of 75 years. We are therefore witnessing an urban explosion in Africa that is unprecedented in the history of mankind.

For the subregions of Africa, the highest urban growth rate in 1980-1985 was in East Africa (nearly 7 per cent a year) followed by West Africa (5.7 per cent). One can easily imagine the town-planning problems posed by such fertility rates.

At the same time, the rural African population will double between 1980 and 2020, rising from 190 million in 1950 to 339 million in 1980 and 668 million in 2020, showing that the problems of rural organization will remain as urgent as town-planning problems.

In 1950, Africa had only three cities with more than 1 million inhabitants: Alexandria, Cairo-Giza and Johannesburg. In 1980, the number of cities of that size had risen to 20, with an average size of 1.9 million. In 2025, projections indicate 36 cities with at least 4 million inhabitants and an average of 9 million, or the size of the largest cities of today's industrialized countries. At that time, it is estimated that Cairo-Giza-Imbaba will have 21 million inhabitants, or nearly half the population of present-day Egypt. Yet, Cairo-Giza is already unable to solve its problems of housing, water supply, sewage and traffic in an environment that is becoming more and more polluted. The sight of groups of squatters living in the "City of the Dead" cemetery has constantly haunted visitors.

In view of these rapid rates of growth of both urban and rural populations, the agricultural economy of Africa is going to face a severe challenge, that is, to increase agricultural production enough to feed an urban population that is going to grow in the astonishing proportions indicated and, to that end, to increase sufficiently the productivity of agricultural workers, whose numbers will double by 2000.

7. *International migration and refugees*

Africans emigrate quite readily across frontiers which, as discussed, often cut across ethnic groups artificially. The two countries with the highest immigration are Côte d'Ivoire, where 21.3 per cent of the population was born abroad and drawn to the country because of its development, especially from Mali and Burkina Faso, and the Gambia, where 11.1 per cent of the population was born abroad. It is not known how many immigrants are living in Nigeria, but there appears to be a large number of them, especially from Ghana.

The African continent is also characterized by a large number of refugees (between one quarter and one fifth of the world's refugees), defined as persons who leave their countries for political reasons and not for other, especially economic, reasons. The Office of the United Nations High Commissioner for Refugees estimates the number of refugees at the beginning of 1985 at 2.9 million. The main host countries are Somalia (700,000, primarily from Ethiopia), the Sudan (approximately 700,000, primarily from Ethiopia and Uganda), Zaire (approximately 320,000, primarily from Angola and to a lesser extent from Burundi and Uganda), Burundi (approximately 260,000, primarily from Rwanda and to a lesser extent from Zaire), the United Republic of Tanzania (180,000, primarily from Burundi and to a lesser extent from Zaire), Uganda (150,000, primarily from Rwanda and to a lesser extent from Zaire), Zambia (95,000, primarily from Angola and to a lesser extent from Zaire, Namibia and South Africa), and Angola (92,000, primarily from Namibia and to a lesser extent from Zaire and South Africa). The countries of origin of refugees, in order of magnitude, include Ethiopia (1,200,000), Rwanda (350,000), Uganda (274,000), Zaire (95,000), Namibia (77,000) and the Sudan (59,000).

VI. CHINA: AN ACCELERATED TRANSITIONAL PROCESS

China's demographic situation, which had long remained a veritable Chinese puzzle to Chinese and foreign demographers because of the failure to conduct or publish censuses (after the 1953 census, the results of the 1964 census were not released for a long time), is now fairly well known in general terms. The data from the remarkable 1982 census were promptly published and made available to analysts throughout the world. They confirmed what had been suspected, namely, a decline in the population growth rate, which, for such a large country, was unprecedented in scope and speed. The only other comparable case is that of Japan, which shortly after the Second World War promulgated the so-called "eugenic protection" act of 1948, opening the way to legal abortions on a wide scale. With its promulgation, abortions equalled the number of births in Japan, and the situation is still roughly the same today.

Under the Chinese Constitution, family planning is a civic duty. However, it was not until the death of Chairman Mao Zedong that population policy in China took a decisive turn at the official level. The reasons most frequently advanced for limiting growth are the scarcity of agricultural resources (11 per cent of the total area of the country is under cultivation, accounting for practically all the arable land) and the concern to ease the employment problems, in particular for young people in the towns and in the countryside, caused by the growing mechanization of farm work.

A glance at the profile of China's total fertility rate since 1940 shows that few countries have known so many ups and downs in so short a time. Before the 1949 Revolution, the rate fluctuated between 5 and 6, a little below the levels usually found in third-world countries before the process of demographic transition. There was an increase at the beginning of the Revolution, which pushed the figure up to about 6.4 in 1956-1957. Then came the "black years", with a devastating famine that made the rate drop to 3.3 in 1961, in a country where the practice of contraception is still on a very small scale. The crisis lasted about four years—from 1958 to 1961—and caused an equally dramatic rise in mortality rates. It was followed, as usually occurs, by a brief period of recovery, which boosted the fertility rate in 1963 to a record level of 7.5. The rate then fell back to that of the pre-famine years, approximately 6.4 between 1966 and 1968. With the Cultural Revolution, the rate fell to 5.3, recorded in 1967. There then ensued the most dramatic drop in the fertility rate ever experienced by any country, this time not by chance or because of events, but because

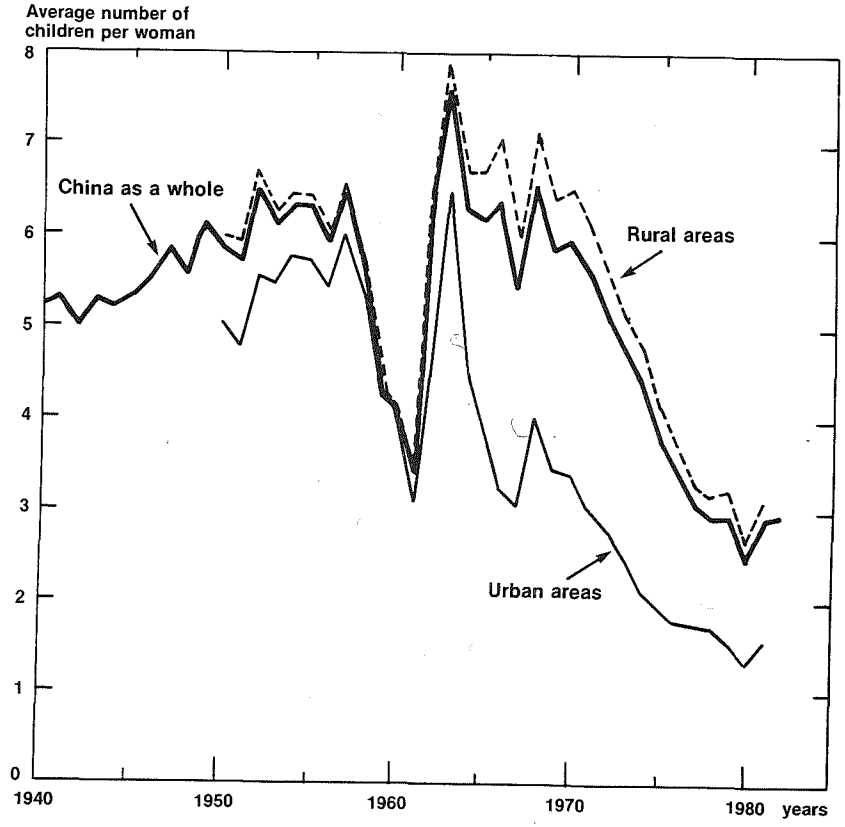
certain effects were desired by the authorities, which had adopted a population policy and had the means to implement it.

Between 1970-1975 and 1980-1985, China's total fertility rate fell from 4.74 to 2.36, that is, a reduction of 50.2 per cent in 10 years. (The figure for the 1980-1985 period is a United Nations estimate.) Of course, the rate has recently increased significantly, from 2.24 in 1980 to 2.63 in 1981 (see figure XIII),[30] but such growth should cease quite quickly.

The declining fertility rate affected urban areas and large population clusters in particular, as can be seen from figure XIII. In 1980 the fertility rate in urban areas fell to the incredibly low figure of 1.15, comparable to that of large European cities. The difference between the rate in urban areas and in rural areas was about 1.3, indicating that the fertility rate in the countryside was more than twice that in the towns and definitely exceeded 2.5 children per woman.

The decline in the fertility rate has been accompanied by an equally remarkable rise in the age at marriage. While marriage is just as common

Figure XIII. Evolution of the total fertility rate from 1940 to 1982 in China as a whole, and from 1950 to 1981 in urban and rural areas (1982 delimitation)



Source: G. Calot, "Données nouvelles sur l'évolution démographique chinoise", *Population*, vol. 39, No. 6 (1984), pp. 1045-1062.

as before (the proportion of single persons is minimal at the end of the reproductive period), people have been marrying at a later age. The average age at marriage for women has risen in the urban areas from 20.0 in 1950 to 25.7, and in the countryside from 18.7 to 22.5. Since 1 January 1981, the legal age at marriage has been 20 for women and 22 for men. It should also be noted, as a demographic anecdote, that before the 1981 law, there was a popular notion that the combined ages of couples at marriage should not be under 50. That led the general public to conclude that the new law, which raised the minimum legal age at marriage, showed a liberal trend. This resulted, in 1980 and 1981, in a slight decline in the age at marriage, and helped push up fertility rates in those two years.

The desire to reduce family size and the increase in the age at marriage have meant that couples are starting to have children later and stopping earlier than in the past. The women with the fewest children are concentrated in the group close to the average child-bearing age, about 27.2 years. Large families or higher child-bearing ages are becoming the exception and are viewed as aberrations both by the authorities and by the general public.

As stated earlier, the fall in China's fertility rates over such a short period is remarkable. The present level is no longer much higher than that required for basic population replacement, 2.1 births per woman, as in the industrialized countries, for the life expectancy of Chinese women is no longer very different from that of European women. While the growth rate is still well above zero (approximately 1.2 per cent), that is essentially because the fall in fertility levels has happened so suddenly and so recently that the growth potential inherent in the population's age structure has not yet had time to diminish. It will be several decades before the effect of that growth potential is fully cancelled out. The same phenomenon has been observed in the industrialized countries, where population growth is continuing and will continue into the beginning of the next century, although for the past two decades population replacement has not been achieved.

The single-child policy was announced in 1979, at a time when the total fertility rate had already fallen to 2.4 children per woman and when the population was close to 1 billion; that figure was confirmed by the 1982 census. The policy was designed to limit the population to 1.2 billion by the end of this century, in accordance with the wishes of the authorities of the Chinese Communist Party. The Seventh Five-Year Plan (1986-1990), published in March 1986, set out to limit the population to 1,113 million by 1990—a figure close to United Nations estimates (according to the medium variant), which projected a figure of 1,124 million by 1990 and 1,256 million by the year 2000.

The official documents have always prohibited any compulsory method of family planning. For a long time, the most widely used methods were intra-uterine devices, preferably supplied to women who had already had one child, and sterilization, preferably for couples who had already had at least two children (see table 30).

Recently, a wider choice of contraceptive methods has been provided, including the pill, and efforts are being made to avoid abortions (for

TABLE 30. DISTRIBUTION OF BIRTH-CONTROL METHODS IN CHINA, BY AGE GROUP

Method	Age							Total
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	
IUD	65.9	71.8	60.9	48.1	41.9	43.7	44.1	50.2
Pill	20.2	13.2	11.7	8.3	6.7	6.4	4.8	8.4
Condom	1.6	1.7	2.2	1.7	1.7	2.4	2.5	2.0
Sterilization (women)	1.5	5.3	15.3	29.6	35.0	30.0	24.2	25.4
Sterilization (men)	0.4	1.3	5.6	9.8	12.4	13.2	16.0	10.0
Others	10.5	6.7	4.3	2.5	2.3	4.3	8.4	4.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: S. Greenhalgh, "Shifts in China's population policy, 1984-1985. Views from the central, provincial and local levels", Population Council, Center for Policy Studies, Population Notes No. 56 (10 June 1986).

which statistics are not available), so as to protect the health of women and thus the welfare of the family.

Every province is free to tailor its own population policy to local social, economic and cultural conditions, while bearing in mind the national goal. The regions with large ethnic minorities implement the general recommendations loosely. Exceptions to the single-child rule are better tolerated in rural areas, especially when the child already born is female or when the family farm cannot survive without additional labour. In such cases, a three- to five-year interval between births is recommended.

From the beginning, the single-child policy was expected to vanish at the end of one generation, that is, shortly after the turn of the century, as soon as the population target was reached.

The apparent relaxation of the single-child policy, which has been observed lately, may be ascribed to the fact that in China, as elsewhere, fertility rates tend to decline naturally as living standards improve, without direct intervention by the authorities. It would seem that China is not an exception to the rule that there is a negative correlation between fertility rates, on the one hand, and education and income, on the other.

The discussion of China's demographic situation cannot be confined to fertility rates, for there is another area in which it had equally spectacular success: that of health and mortality. China's leaders had clearly understood that the two fields were inextricably linked, and that barefoot doctors were the indispensable allies of intra-uterine devices. The barefoot-doctor policy was formulated early on, as it was at the origin of the primary-health-care policy endorsed at the world level by the 1979 Alma Ata Conference; the philosophy behind that policy has been adopted by WHO.

Estimates made by William Brass[31] show that around 1955 life expectancy at birth in China was about 40 years, that is, roughly the same as in India around the same time. (According to United Nations estimates, life expectancy in India was 38.7 years during the period 1950-1955 and

45.5 years during the period 1960-1965.) The figure for China rose to 59.6 years for 1965-1970, 65.8 for 1975-1980 and, according to United Nations statistics, 67.8 for 1980-1985. The curve appears to have plunged to an unknown level during the "black years" from 1958 to 1962, when it is estimated that famine claimed tens of millions of Chinese lives.

If we ignore that break in the curve of life expectancy in China, we can say that life expectancy increased by 27.0 years over a 30-year period between 1950-1955 and 1980-1985. This is quite an exceptional increase, which, as with fertility levels, is unrivalled in any other country. A veritable crusade on a national scale, but mobilizing all the administrative authorities, has involved the population in campaigns to promote hygiene (campaigns against flies and rats) and mass immunization. This has been accompanied by the setting up of vast and mostly decentralized training systems for medical personnel. When we consider that in the period 1950-1955 many countries had the same life expectancy at birth as China, we realize that China is the country that has had, by far, the greatest increase. Its closest competitor is the Republic of Korea, where life expectancy at birth, which was 47.5 years in 1950, reached the same figure as in China in 1985, namely, 67.5.

Such progress is especially remarkable since China is an essentially rural country (79 per cent); but the rural population is now showing few signs of growth (growth rate under 0.5 per cent over the past few years) and large migration movements are going to swell the cities.

China's urbanization rate is relatively low, about 20 per cent. By the year 2000, a quarter of China's population will be living in urban areas, and by 2025 slightly less than half, far below the figure for the third world as a whole (57.7 per cent). The three largest cities, Shanghai (11.8 million), Beijing (9.2 million) and Tianjin (7.8 million), are sure to expand further, albeit more slowly than the large cities of Latin America (Mexico City and Sao Paulo).

Of course, the significant changes in fertility and mortality rates were bound to leave their mark on age structure. Figure XIV shows how age structure evolved between the three censuses, in 1953, 1964 and 1982. The age structure in 1953 was typical of that of countries with high fertility and high mortality rates. The age structure in 1964 has an indentation at its base caused by the "black years" of 1958 to 1961, and the age structure in 1982 has the dent which lower fertility rates caused in the under-20 age group. The pyramid has taken on the shape of an inverted spinning-top. Thus, we see that China is undergoing one of the fastest aging processes ever observed. The outstanding feature of this process is that it is taking place simultaneously at the base of the pyramid, owing to declining fertility levels, and at the apex, owing to declining mortality levels, whereas historically in European countries such processes have started at the bottom before occurring at the top. We may well imagine that this phenomenon is of concern to the Chinese authorities, who must consider its economic and social implications, especially from the point of view of the active population and the retirement system.[32]

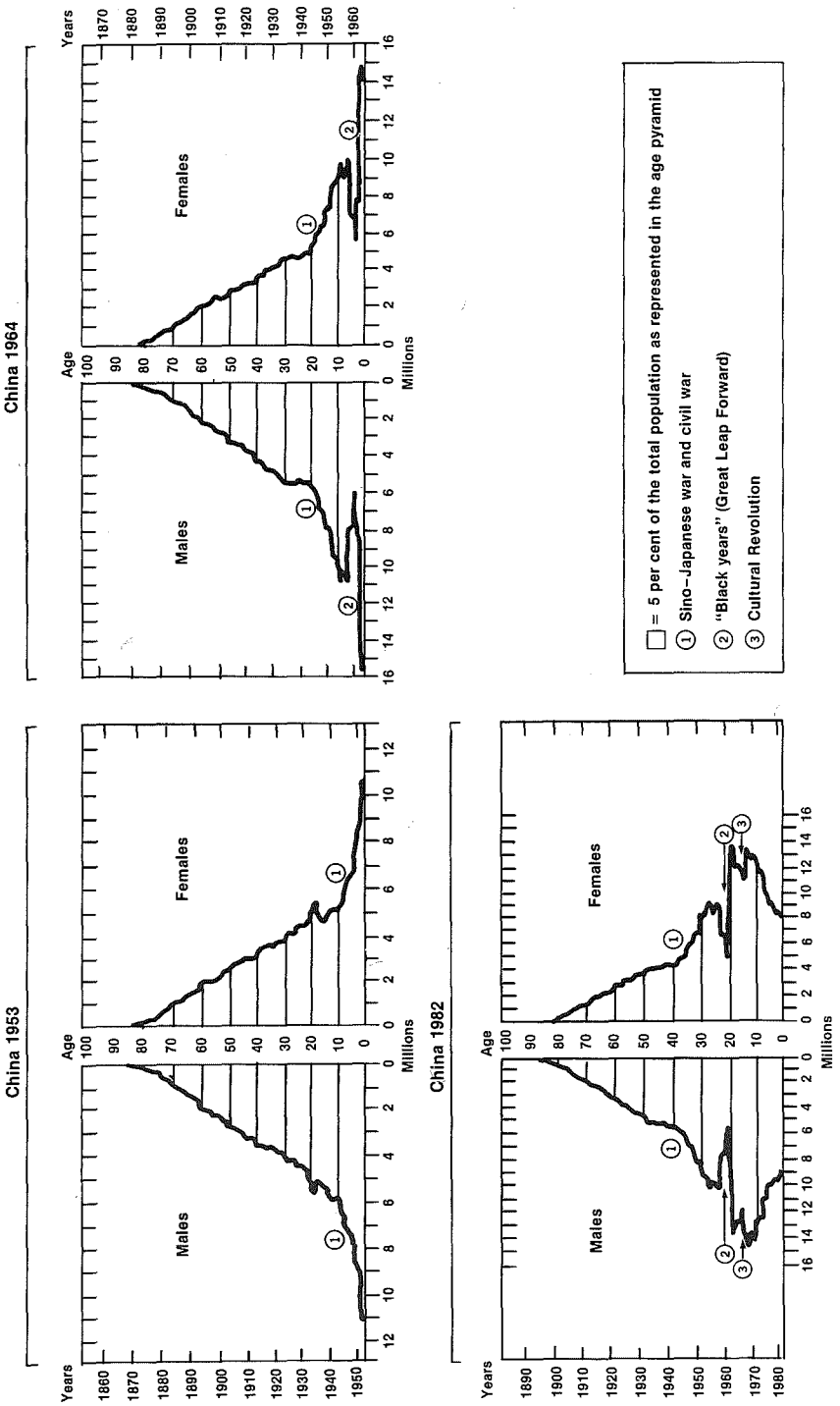


Figure XIV. Compared population pyramids in China at the time of the 1953, 1964 and 1982 censuses

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