II. PAST AND FUTURE TRENDS IN MORTALITY

During the twentieth century, mortality experienced the most rapid decline in the history of humanity. Although the sustained reduction of mortality started in the eighteenth century, it gained momentum in the early part of the twentieth century as better hygiene, improved nutrition and medical practices based on scientific evidence became the rule in the more advanced countries. Despite the setbacks brought about by the two world wars, by 1950-1955 the widespread use of antibiotics and the growing use of vaccines had contributed to reduce mortality markedly in the more developed regions and the average life expectancy at birth for their populations had reached 66.2 years. The mid-century also marked an important turning point in the less developed regions. With the expanded use of antibiotics, vaccines and insecticides, mortality in the developing world began to decline rapidly, so that life expectancy increased by 53.4 per cent between 1950-1955 and 1995-2000, rising from 41 years to 62.9 years. As a result, the world's life expectancy at birth increased from 46.5 years in 1950-1955 to 65 years in 1995-2000, a gain of 18.5 years (see figure II.1). Furthermore, the mortality differentials between the less developed and the more developed regions narrowed, so that by 1995-2000 the difference in life expectancy between the two groups amounted to 12 years instead of the 25.2 year difference that existed in 1950-1955.

There remains, however, a group of countries where the reduction of mortality has lagged behind. In the least developed countries life expectancy rose from 35.5 years in 1950-1955 to 50.3 years in 1995-2000, a 41.6 per cent gain, but the difference between their life expectancy and that of the less developed regions as a whole increased from 5.5 years in 1950-1955 to 12.6 years in 1995-2000. A major reason for such increase is that the 48 countries classified as least developed include 26 that are highly affected by the HIV/AIDS epidemic. Furthermore, the less developed regions include several very populous countries that have made major strides in reducing mortality and where levels of life expectancy are today similar to those of more developed regions. China, with 1.3 billion inhabitants, is among those countries. Clearly, the countries that constitute the less developed regions are heterogeneous both in terms of the levels of life expectancy achieved and with respect to the pace at which those levels have been reached. In the long run, however, mortality differentials between the major development groups are expected to narrow further. By 2045-2050, life expectancy at the world level is expected to reach 76 years, being the result of 82.1 years of life expectancy in the more developed regions and 75 years in the less developed regions as a whole, among which the least developed countries are expected to reach a life expectancy of 69.7 years. Consequently, the difference in life expectancy between the less developed regions as a whole and the least developed countries is expected to decrease significantly in the future, reaching 5.3 years in 2045-2050, a figure similar to that estimated for 1950-1955.

As noted above, by 1950-1955, the transition from high to low mortality was already far advanced in the more developed regions where life expectancy ranged from 63.3 years in Southern Europe to 69.6 years in Australia/New Zealand. In the less developed regions, a combination of medical advances to combat or prevent infectious disease and concerted campaigns either to control the vectors responsible for spreading disease or to improve hygiene had also contributed to a reduction of mortality. As shown in figure II.2, by 1950-1955 the life expectancy at birth of Latin America and the Caribbean had reached 51.4 years but life expectancy levels in Africa and Asia were much lower, at 37.8 years and 41.3 years respectively, though in both cases these levels surpassed the very low life expectancies that had prevailed in all major areas during historical times. Moreover, among the six major areas whose life expectancies are presented in figure II.2, Africa, Asia, and Latin America and the Caribbean experienced the most rapid declines of mortality during 1950-2000. In both Africa and Latin America and the Caribbean, such declines amounted to about 35 per cent, but in Asia life expectancy rose by almost 60 per cent. In the

Figure II.1. Life expectancy at birth for the world and development groups, selected periods, 1950-2050

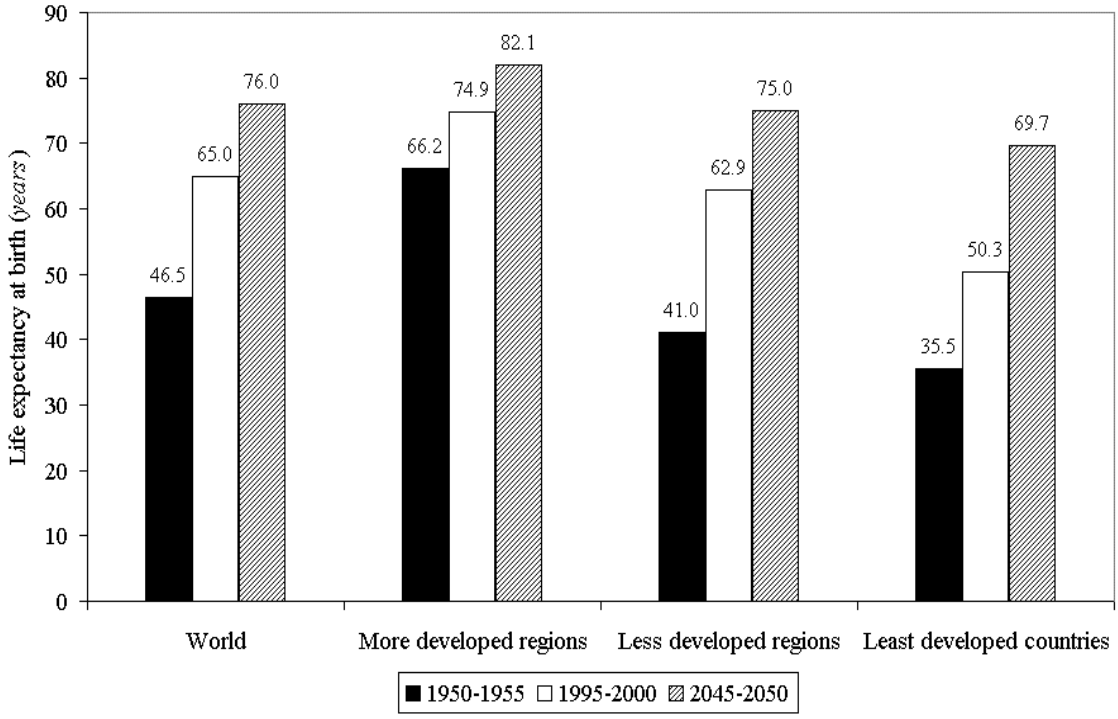
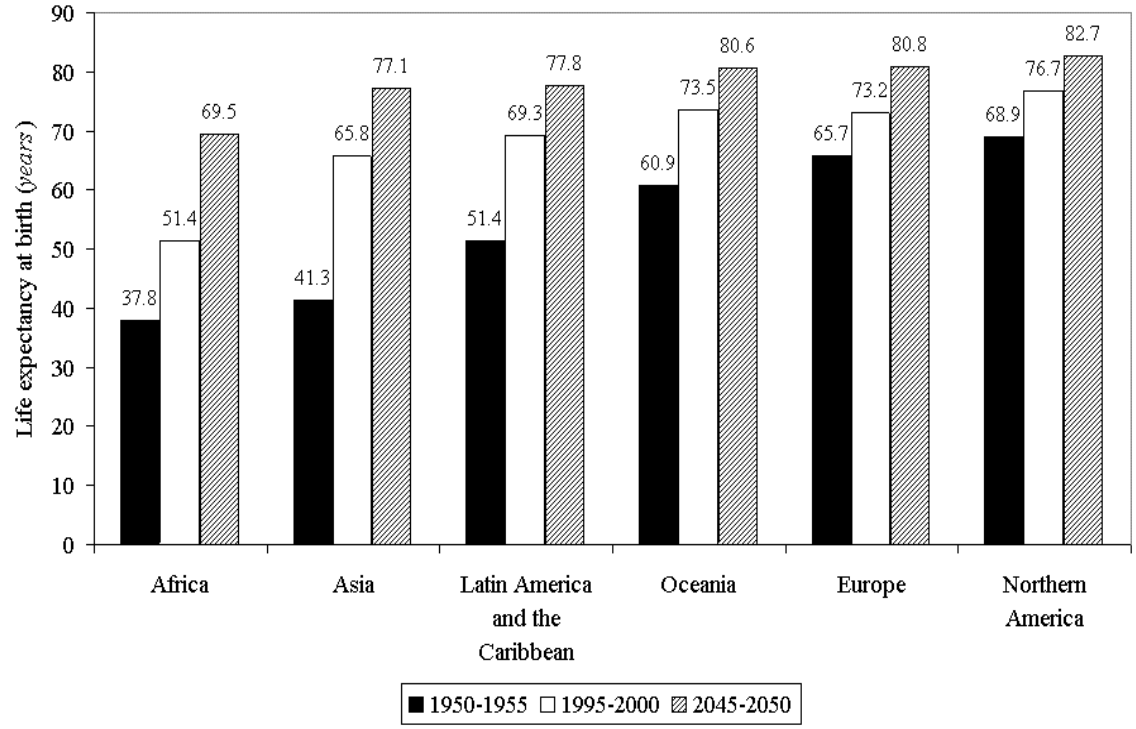


Figure II.2. Life expectancy at birth by major area for selected periods, 1950-2050



three other major areas of the world, all of which had life expectancy levels above 60 years in 1950-1955, increases were substantially lower. Nevertheless, Northern America exhibited the highest levels of life expectancy both in 1950-1955 and in 1995-2000; Oceania's life expectancy was the second highest in 1995-2000, and Europe lagged behind because of the setbacks experienced in Eastern Europe. By 2045-2050, life expectancy at birth in each of these three major areas is projected to be above 80 years, while those of Asia and Latin America and the Caribbean are expected to reach levels of approximately 77 years. Africa is expected to be the only major area with a life expectancy below 70 years in 2045-2050, although it is the major area expected to register the strongest mortality decline during the first half of the twenty-first century, with a 35.4 per cent increase in life expectancy (or 18.1 years). All other major areas are projected to register smaller relative gains, ranging from 7.7 per cent in Northern America to 17.3 per cent in Asia.

Until fairly recently it was expected that mortality would continue declining in all countries, especially in those that were still experiencing moderate to high mortality levels because of their late start in the transition to low mortality. However, two developments have made it necessary to adjust these expectations. First, the emergence of the virus that causes the acquired immunodeficiency syndrome (AIDS) and the worldwide pandemic that it has generated have already produced marked increases in mortality in the countries most affected by the disease. Second, it has become evident that mortality has tended to stagnate or even to increase in certain countries with economies in transition, most of which exhibited fairly low mortality in 1950-1955. In particular, the Russian Federation has experienced a decline of life expectancy since 1985-1990 and by 1995-2000 it had a life expectancy just above its 1950-1955 level. The causes for this slowing down or reversal of the transition to low mortality are multiple and complex, but they have undoubtedly been exacerbated by the momentous social and economic transformations resulting from the political changes taking place in the former communist countries since 1985. However, it should be stressed that in most of the countries concerned, the stagnation of mortality preceded such transformations.

As a result of these developments and in light of the mortality increases that have occurred in countries affected by conflict or civil strife, considerable uncertainty exists about the future path of mortality. It seems less certain than a decade or two ago that mortality will necessarily decrease in all countries in the future. Nevertheless, mortality has declined more rapidly than expected in a number of developed countries, so that the possibility of further medical and technological breakthroughs that may increase the human life span cannot be ruled out, opening up the prospect of a future where expectations of life at birth above 85 years or 90 years will be a reality in certain populations. As previous *Revisions*, the *2000 Revision* has taken account of some of these possible developments by making explicit allowance for the impact of HIV/AIDS and moderating somewhat the future mortality decline of certain countries with economies in transition. As a result, it is projected that a number of countries will see their levels of mortality stagnate or increase over the medium-term future, although for the majority of countries a steady decline of mortality is assumed. For the latter countries, the pace of mortality reduction is established using a model of gains in life expectancy that produces smaller increases as that level rises.

In contrast to the approach used in projecting future fertility levels, the one used to project mortality does not assure the convergence of country groups to pre-selected levels. Furthermore, for each country, a single set of assumptions about the future course of mortality is used in all projection variants. For comparison purposes, in the *2000 Revision* a constant-mortality scenario that keeps the expectation of life constant at 1995-2000 levels during the projection period and adopts the fertility and international migration assumptions of the medium variant has also been produced. Consequently, to facilitate the exposition in this chapter, the projection results discussed will largely be those referring to the medium variant and to the constant-mortality scenario. It must be noted, however, that owing to changes in the distribution of the population

among countries brought about by the different fertility assumptions underlying the various projection variants, the projected values of mortality indicators at the regional level or for any geographical aggregate will vary slightly from one variant to another.

This chapter will describe the mortality trends experienced by countries and the various world regions since 1950 and discuss their implications for the future of the mortality transition. A more detailed analysis of the implications of HIV/AIDS for the future course of mortality and for the general population dynamics of the countries most affected by the epidemic is presented in chapter III.

A. THE MORTALITY TRANSITION IN THE SECOND PART OF THE TWENTIETH CENTURY

The extent and impact of the transition to low mortality cannot be overemphasized. Not only has the world's life expectancy at birth increased by 40 per cent between 1950-1955 and 1995-2000, but most countries of the world have also recorded major gains in life expectancy. To gauge the significance of the changes experienced it suffices to note that, whereas in 1950-1955 the expectation of life at birth was 70 years or higher in only six countries, by 1995-2000 there were 82 countries in that category, representing 44 per cent of the 187 countries whose population is projected using the components method and accounting for 23 per cent of the world population. At the other extreme, 95 countries had an expectation of life at birth lower than 50 years in 1950-1955, comprising more than 60 per cent of the world population, but by 1995-2000 the number of countries with a life expectancy lower than 50 years had been reduced to 26, accounting for less than 5 per cent of the world population. The nearly universal reduction of mortality occurring since 1950 has represented a major improvement in the lives of people. Nevertheless, there is increasing cause for concern about instances of reversals in the gains accrued. Thus, whereas the world's life expectancy at birth increased by two years from 1985-1990 to 1995-2000, sub-Saharan Africa experienced a one year reduction in its life expectancy. Eastern Africa and Southern Africa have been particularly affected, losing 2.9 years and 2.7 years of life expectancy respectively during that period. Outside of Africa, Eastern Europe also experienced a reduction of 2 years in its life expectancy between 1985-1990 and 1995-2000.

Countries affected by conflict or by the expanding HIV/AIDS epidemic are more likely to have low levels of life expectancy at birth or to have experienced a reduction of life expectancy. Thus, in 1995-2000, 26 countries still had life expectancies at birth below 50 years. Among them, only two are not in Africa–Afghanistan and East Timor–both of which have experienced prolonged conflict. Of the remaining 24, 21 are highly affected by the HIV/AIDS epidemic. Sierra Leone and Rwanda are the only two countries having expectations of life below 40 years, largely because they both have had to deal with the dual negative impacts of HIV/AIDS and conflict.

Overall, the effects of the HIV/AIDS epidemic, conflict and economic downturns have slowed the reduction of mortality differentials at the regional level. As table II.1 indicates, in 1995-2000 the expectation of life for Africa was just 51.4 years, whereas both Asia and Latin America and the Caribbean had expectations of life above 65 years (65.8 years for Asia and 69.3 years for Latin America and the Caribbean). Furthermore, although the less developed regions as a whole achieved a life expectancy of 62.9 years, the least developed countries barely managed to attain an expectation of life above 50 years. Since most of the least developed countries are located in Africa, the regions of that continent exhibited some of the lowest expectations of life. These include Eastern Africa with 45.7 years of life expectancy at birth; Middle Africa with 48.9 years; and Western Africa with 50 years. Life expectancy was considerably higher in Northern Africa (64.6 years) and in Southern Africa (55.4 years), although in the latter region the HIV/AIDS epidemic had already reduced the growth of life expectancy.

In order to assess on a comparative basis the gains made by different regions or countries in terms of increases of life expectancy, an index of mortality decline was calculated by comparing the increase in life expectancy recorded by a given region between 1950-1955 and 1995-2000 and the maximum gain judged possible. This procedure

TABLE II.1. LIFE EXPECTANCY AT BIRTH IN 1950-1955 AND 1995-2000 AND SELECTED INDICATORS OF TRENDS AND DIFFERENTIALS BY SEX FOR THE WORLD, MAJOR AREAS AND REGIONS

Major area or region	Both sexes (years)		Mortality decline index	Male (years)		Female (years)		e_0 ratio		Female to male ratio
	1950-1955	1995-2000		1950-1955	1995-2000	1950-1955	1995-2000	1995-2000 to 1950-1955		
								Male	Female	
World	46.5	65.0	54.4	45.2	62.9	47.9	67.1	1.39	1.40	1.006
More developed regions	66.2	74.9	60.7	63.6	71.1	68.6	78.6	1.12	1.15	1.025
Less developed regions	41.0	62.9	55.5	40.2	61.4	41.8	64.5	1.53	1.54	1.010
Least developed countries	35.5	50.3	32.9	35.0	49.4	36.1	51.2	1.41	1.42	1.003
Less developed regions without the least developed countries	41.8	65.5	61.2	41.0	63.9	42.7	67.2	1.56	1.57	1.010
Europe	65.7	73.2	50.8	63.1	69.1	68.0	77.4	1.09	1.14	1.040
Eastern Europe	64.3	68.2	24.4	60.7	63.0	67.0	73.6	1.04	1.10	1.058
Northern Europe	69.2	76.7	66.9	66.8	73.9	71.5	79.6	1.11	1.11	1.007
Southern Europe	63.3	77.0	79.6	61.5	73.7	65.2	80.2	1.20	1.23	1.027
Western Europe	67.6	77.7	78.4	65.1	74.3	69.9	80.9	1.14	1.16	1.015
Northern America	68.9	76.7	67.6	66.1	73.8	71.9	79.6	1.12	1.11	0.992
Oceania	60.9	73.5	64.6	58.5	71.0	63.5	76.1	1.21	1.20	0.988
Australia/New Zealand	69.6	78.4	81.3	67.0	75.6	72.3	81.2	1.13	1.12	0.996
Melanesia	37.7	58.7	49.0	36.8	57.6	38.9	60.0	1.57	1.54	0.985
Micronesia	52.0	71.8	69.5	50.3	69.7	54.2	74.2	1.39	1.37	0.988
Polynesia	47.1	70.3	69.5	45.0	67.7	49.7	73.3	1.50	1.47	0.981
Africa	37.8	51.4	31.7	36.5	50.3	39.2	52.4	1.38	1.34	0.970
Eastern Africa	36.5	45.7	20.8	35.1	44.8	38.0	46.5	1.28	1.23	0.959
Middle Africa	36.0	48.9	28.9	34.4	47.5	37.6	50.2	1.38	1.33	0.964
Northern Africa	41.8	64.6	58.8	40.7	63.0	43.0	66.1	1.55	1.54	0.993
Southern Africa	44.2	55.4	30.9	43.0	52.9	45.3	57.9	1.23	1.28	1.039
Western Africa	35.5	50.0	32.2	34.2	49.3	36.9	50.7	1.44	1.37	0.951
Asia	41.3	65.8	62.5	40.7	64.3	42.1	67.4	1.58	1.60	1.014
Eastern Asia	42.9	70.9	74.6	41.4	68.7	44.7	73.4	1.66	1.64	0.989
South-central Asia	39.3	61.5	53.8	40.0	61.0	38.7	62.0	1.53	1.60	1.050
South-eastern Asia	41.0	65.3	61.7	39.9	63.2	42.1	67.5	1.58	1.60	1.013
Western Asia	45.2	67.9	64.3	43.6	65.8	46.8	70.0	1.51	1.50	0.992
Latin America and the Caribbean	51.4	69.3	61.5	49.7	66.1	53.1	72.6	1.33	1.37	1.030
Caribbean	52.1	67.5	54.3	50.8	65.0	53.5	70.2	1.28	1.31	1.024
Central America	49.2	71.0	69.8	47.7	68.2	50.8	73.9	1.43	1.46	1.017
South America	52.0	68.9	59.3	50.3	65.5	53.8	72.5	1.30	1.35	1.034

NOTE: For a definition of the mortality decline index, see text, p. 66.

meant establishing the difference between the maximum life expectancy experienced by a country in 1995-2000 (namely, 80.5 years, corresponding to Japan) and the level experienced by the region or country under consideration in 1950-1955. That is, if $e_0(1)$ and $e_0(2)$ represent, respectively, the life expectancy levels at the first and second periods, and $e_0(M)$ corresponds to the maximum life expectancy considered possible in the second period, the index of mortality decline is calculated as follows:

$$(e_0(2) - e_0(1))*100 / (e_0(M)-e_0(1))$$

Therefore, the index represents the portion of the maximum possible increase of life expectancy that has already been achieved. The higher the index, the closer a region or country came to achieving the maximum potential reduction of mortality. The advantage of such an index is that it controls for the initial level of life expectancy, which, as already noted, varied considerably among regions in 1950-1955.

As table II.1 shows, the mortality decline index for the world is 54 per cent, a level determined largely by that experienced by the less developed regions (56 per cent) since they account for about 80 per cent of the world population. It bears stressing that the less developed regions without the least developed countries display the same value of the index of mortality decline as that estimated for the more developed regions (61 per cent). The least developed countries, with an index of 33 per cent, are largely responsible for the shortfall experienced by the less developed region as a whole. Although the values of the index of mortality decline for these broad aggregates are revealing, they conceal the specificities of smaller regions and of different countries.

The values of the mortality decline index displayed in table II.1 indicate that the regions of Africa are not only characterized by having a low expectation of life in 1995-2000 but also by having made modest advances in relation to the maximum potential increase. Africa as a whole did not realize even one third of the maximum potential increase between 1950-1955 and 1995-2000 (32 per cent); only Northern Africa achieved more than half of that potential increase, with an index value of 59 per cent. The only other region with an index value below 50 per cent is Melanesia (49 per cent), a region characterized by having had, both in 1950-1955 and 1995-2000, the lowest life expectancy among developing regions outside of Africa. Aside from the regions of sub-Saharan Africa and Melanesia, all other less developed regions saw their life expectancies increase by at least half of the potential maximum. Especially large gains were recorded by Eastern Asia, Central America, Polynesia and Micronesia (amounting to more than two thirds of the maximum potential increase), all of which had achieved life expectancies above 70 years in 1995-2000. The most modest increases in regions outside of Africa and Melanesia were recorded by South-central Asia and the Caribbean, where life expectancy increased by just over half of its potential maximum (54 per cent). South America registered an index value of 59 per cent.

In the more developed regions, where life expectancy was already fairly high in 1950-1955, levels of life expectancy have converged significantly, ranging from 76.7 to 78.4 years in 1995-2000, with the exception of Eastern Europe. Particularly large relative gains were achieved by Australia and New Zealand, as well as by Southern Europe and Western Europe, where 78 per cent or more of the maximum potential rise in life expectancy was achieved. Northern Europe and Northern America, which were characterized by having been the regions with the second and third highest life expectancies in 1950-1955, achieved somewhat lower values of the mortality decline index (67 per cent and 68 per cent, respectively). Yet, undoubtedly the most striking development among the more developed regions is the extremely low value of the mortality decline index for Eastern Europe, a region that only managed to realize 24 per cent of the maximum potential increase in life expectancy between 1950-1955 and 1995-2000. Such a low relative gain is comparable and in some cases even lower than those recorded by African regions. Although life expectancy in Eastern Europe remains in the high range (68.2 years in 1995-2000), the setbacks experienced in recent years are a cause for concern.

Table II.1 also displays life expectancy levels by sex at the regional level for 1950-1955 and

1995-2000. By 1995-2000, the female life expectancy was higher than the male life expectancy in all regions, although the difference between female and male life expectancies was relatively small in South-central Asia. However, even in that region, there had been a marked gain in life expectancy for females in relation to that of males, especially given that in 1950-1955 South-central Asia was the only region where females had a lower life expectancy than males.

To gauge the relative gains in life expectancy made by males and females, the ratio of life expectancy at birth in 1995-2000 to that in 1950-1955 has been calculated by sex and is presented in table II.1. At the world level, ratios for males and females are very similar (1.39 versus 1.40), a trend that is mainly determined by the less developed regions (1.53 versus 1.54). Although the ratios are lower in the more developed regions, they differ more markedly (1.12 versus 1.15) indicating that female life expectancy increased faster than that of males during 1950-2000. For both males and females, the highest and lowest ratios among regions are found in Eastern Asia and Eastern Europe respectively.

Table II.1 also displays the female to male ratio of the ratios of life expectancy. A female to male ratio greater than one implies that female life expectancy increased relatively more than that of males and that the sex differential in life expectancy has widened; the reverse is true if the ratio is less than one. At the world level, the increase in the female to male differential in life expectancy is very modest (0.6 per cent, that is, a female to male ratio of 1.006). However, this result masks the important variations found across regions. The more developed regions, for instance, display a ratio of 1.025, while the less developed regions have a ratio of just 1.010, and an even lower ratio is displayed by the least developed countries (1.003), indicating the greater relative progress made by females living in developed countries and in developing countries other than the least developed ones. Thus, at the regional level, four out of the six more developed regions had a ratio greater than one, whereas only six of the fifteen less developed regions had ratios above one. Among the more developed regions, all regions of Europe had female to male ratios greater than one but Australia/New Zealand and Northern America had ratios slightly under one. In fact, Europe's ratio of 1.040 is the highest among all major areas. However, it is influenced by the increasing sex differential in life expectancy in Eastern Europe, which had the highest female to male ratio (1.058). The female to male ratios of Northern Europe and Western Europe were considerably lower and therefore more in line with those from other more developed regions. Among the less developed regions, all the regions of Latin America and the Caribbean, as well as South-central Asia, South-eastern Asia and Southern Africa had female to male ratios greater than one.

An alternative indicator of mortality differentials by sex is the difference from unity of the female to male ratio of life expectancy expressed in percentage terms, that is:

$$SD = [(e_0^f / e_0^m) - 1] * 100,$$

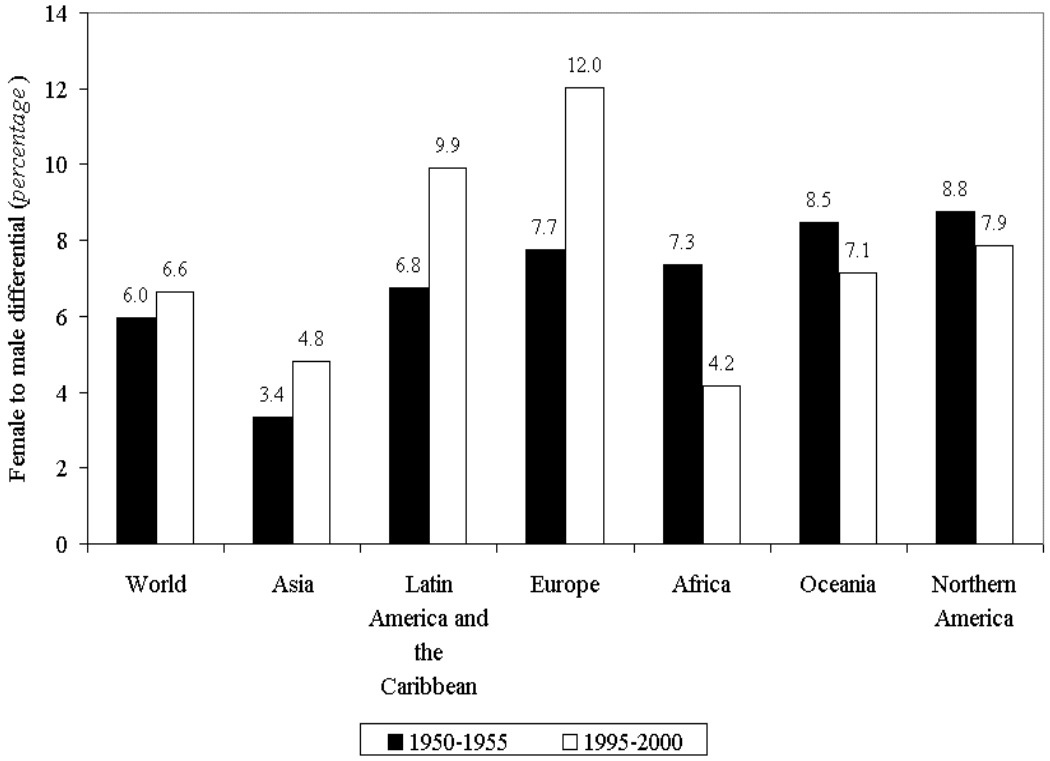
This measure is known as the sex differential in life expectancy and it permits a more direct assessment of the effects of differential gains in life expectancy by sex. At the world level, the sex differential in life expectancy increased from 6 per cent in 1950-1955 to 6.6 per cent in 1995-2000 (table II.2 and figure II.3), an increase of 11.5 per cent in favour of females. As the index of mortality decline indicated, female life expectancy increased more than male life expectancy in relative terms in three major areas: Asia, Europe and Latin America and the Caribbean. In terms of sex differentials, these major areas experienced net increases ranging from 42.9 per cent to 55.2 per cent. In contrast, in Africa, Northern America and Oceania the sex differentials declined. In Europe, female life expectancy made the greatest gains with respect to that of males, whereas in Africa male life expectancy made the greatest gains with respect to that of females and the sex differential in life expectancy declined markedly. Generally, sex differentials in life expectancy differed less in 1950-1955, when they ranged from 3.4 per cent to 8.8 per cent, than in 1995-2000, when they varied from 4.2 per cent to 12.0 per cent.

TABLE II.2. LIFE EXPECTANCY AT BIRTH BY SEX IN 1950-1955 AND 1995-2000 AND CORRESPONDING SEX DIFFERENTIALS FOR THE WORLD AND MAJOR AREAS

	Life expectancy at birth (years)				*Sex differentials in e_0 [(Female e_0 / Male e_0) -1]*100*		*Relative change in sex differentials (percentage)*
	1950-1955		*1995-2000*				
Major area	*Male*	*Female*	*Male*	*Female*	*1950-1955*	*1995-2000*	*1995-2000 to 1950-1955*
	(a)	*(b)*	*(c)*	*(d)*	*e = 100* ((b / a)-1)*	*f = 100* ((d / c)-1)*	*g = 100* ((f / e)-1)*
World	45.2	47.9	62.9	67.1	6.0	6.6	11.5
Europe	63.1	68.0	69.1	77.4	7.7	12.0	55.2
Latin America and the Caribbean	49.7	53.1	66.1	72.6	6.8	9.9	46.8
Asia	40.7	42.1	64.3	67.4	3.4	4.8	42.9
Northern America	66.1	71.9	73.8	79.6	8.8	7.9	-10.3
Oceania	58.5	63.5	71.0	76.1	8.5	7.1	-15.7
Africa	36.5	39.2	50.3	52.4	7.3	4.2	-43.2

NOTE: Major areas are ordered according to the relative change in sex differentials.

Figure II.3. Sex differentials in life expectancy at birth by major area, 1950-1955 and 1995-2000



Country level analysis

Given the diversity of country experiences with regard to the transition to low mortality, it is instructive to consider trends at the country level. Table II.3 shows tshowsshohe same indicators of mortality levels, trends and differentials for developed countries with market economies as those used to discuss trends at the regional level and presented in table II.1. In table II.3, as in the other tables included in this section, the mortality decline index is calculated in the same way as in table II.1, using the 1995-2000 life expectancy at birth estimated for Japan as the maximum value possible. Overall, the countries listed in table II.3 were by 1950 the most advanced in the transition to low mortality. Even at that early date, only one country, Portugal, had a life expectancy below 60 years, and for all other countries there was relatively little variation in life expectancy levels, which ranged from 63.9 years to 72.7 years. By 1995-2000, the variation in life expectancy levels had declined, with all developed market–economy countries, including Portugal, having estimated life expectancies ranging between 75.2 years and 80.5 years. Despite their already low mortality levels in 1950-1955, all countries in this group, except Denmark, experienced sizeable relative mortality declines over the next 45 years, tending to achieve about two thirds or more of the maximum potential increase in life expectancy. Particularly high gains in relation to the maximum potential were experienced by Canada, Greece, France, Australia, Switzerland, Italy, Spain, Sweden and Japan (ordered according to an increasing index of mortality decline). Only Denmark realized less than 66 per cent of the maximum potential increase: with a mortality decline index of 51 per cent, Denmark went from being the country with the fifth highest life expectancy at birth amongst this group of countries in 1950-1955 to having the second lowest life expectancy in 1995-2000 (75.9 years), just above that of Portugal.

Among all the developed countries with market economies, female life expectancy was higher than that of males, both in 1950-1955 and 1995-2000. In addition, increases in female life expectancy over the 1950-2000 period surpassed those of male life expectancy in most countries. However, for six countries, there was a slight narrowing of the female to male differential in life expectancy, namely for Australia, the Channel Islands, Finland, Luxembourg, the United Kingdom and the United States of America.

Table II.4 shows the same indicators as table II.3 for the more developed countries with economies in transition. Just as for the more developed countries with market economies, countries with economies in transition tended to be at a fairly advanced stage of the transition to low mortality as early as 1950-1955, although a fifth still had life expectancies below 60 years at that time. However, as the index of mortality decline indicates, by 1995-2000 few of them had attained more than 60 per cent of the maximum potential increase in life expectancy. The countries with the largest values for the index of mortality decline tended to be those with the lowest life expectancies in 1950-1955, notably Albania and the successor States of the former Yugoslavia. Aside from Lithuania, which made moderate progress, very low relative gains characterized the successor States of the former USSR, with the Russian Federation registering the lowest value for the index of mortality decline among countries with economies in transition (9 per cent). In fact, at the world level, only six other countries, all of which are struggling with the HIV/AIDS epidemic, had a lower value for that index. Moderate values for the mortality decline index, ranging from 40 per cent to 60 per cent, were observed in the remaining countries, including Bulgaria, the Czech Republic, Hungary, Romania, Slovakia and Poland. With regard to sex differentials in life expectancy, the changes taking place have tended to be more detrimental to males than females, so that female to male differentials in life expectancy have been rising in nearly all countries in this group, the sole exception being the Republic of Moldova.

In the developing world, the set of countries that have not been significantly affected by the HIV/AIDS epidemic is considered first. Table II.5 presents the relevant indicators for the countries of Africa where the prevalence of HIV/AIDS among the adult population is very low or nil. Most of these countries, particularly those located in sub-Saharan Africa, were still at a relatively early stage of the transition to low mortality in 1950-1955. At that time, as table II.5 indicates,

TABLE II.3. LIFE EXPECTANCY AT BIRTH IN 1950-1955 AND 1995-2000 AND SELECTED INDICATORS OF TRENDS AND DIFFERENTIALS BY SEX FOR DEVELOPED COUNTRIES WITH MARKET ECONOMIES

Country or area	Both sexes (years)			Male (years)		Female (years)		e_0 ratio		
								1995-2000 to 1950-1955		
	1950-1955	1995-2000	Mortality decline index	1950-1955	1995-2000	1950-1955	1995-2000	Male	Female	Female to male ratio
Norway	72.7	78.1	70.3	70.9	75.2	74.5	81.1	1.06	1.09	1.027
Netherlands	72.1	77.9	68.9	70.9	75.1	73.4	80.5	1.06	1.10	1.035
Iceland	72.0	78.9	81.8	70.0	76.6	74.1	81.3	1.09	1.10	1.003
Sweden	71.8	79.3	86.8	70.4	76.8	73.3	81.8	1.09	1.12	1.024
Denmark	71.0	75.9	51.5	69.6	73.4	72.4	78.3	1.05	1.08	1.026
Channel Islands	70.6	77.6	70.7	67.4	75.2	73.7	79.9	1.12	1.08	0.972
New Zealand	69.6	77.2	69.9	67.5	74.5	71.8	79.9	1.10	1.11	1.007
Australia	69.6	78.7	83.6	66.9	75.9	72.4	81.5	1.13	1.13	0.993
Switzerland	69.2	78.6	83.7	67.0	75.4	71.6	81.8	1.13	1.14	1.015
United Kingdom	69.2	77.2	71.1	66.7	74.7	71.8	79.7	1.12	1.11	0.991
Canada	69.1	78.5	83.0	66.8	75.7	71.6	81.3	1.13	1.14	1.001
United States of America	68.9	76.5	66.0	66.1	73.6	72.0	79.4	1.11	1.10	0.991
Belgium	67.5	77.9	80.3	65.0	74.7	70.2	81.1	1.15	1.16	1.006
Germany	67.5	77.3	75.6	65.3	74.0	69.6	80.3	1.13	1.15	1.018
Ireland	66.9	76.1	67.9	65.7	73.5	68.2	78.8	1.12	1.16	1.033
France	66.5	78.1	83.1	63.7	74.2	69.5	82.0	1.17	1.18	1.013
Finland	66.3	77.2	76.6	63.2	73.4	69.6	80.7	1.16	1.16	0.998
Italy	66.0	78.2	84.6	64.3	75.0	67.8	81.4	1.17	1.20	1.029
Malta	65.9	77.6	80.0	64.2	74.9	67.7	80.2	1.17	1.18	1.015
Luxembourg	65.9	77.0	76.0	63.1	73.6	68.9	80.1	1.17	1.16	0.997
Greece	65.9	78.0	83.0	64.3	75.4	67.5	80.7	1.17	1.20	1.020
Austria	65.7	77.7	81.1	63.2	74.4	68.4	80.7	1.18	1.18	1.002
Japan	63.9	80.5	100.0	61.6	77.0	65.5	83.8	1.25	1.28	1.023
Spain	63.9	78.1	86.0	61.6	74.6	66.3	81.8	1.21	1.23	1.019
Portugal	59.3	75.2	75.2	56.9	71.6	61.9	78.8	1.26	1.27	1.012

NOTE: Countries are ordered according to life expectancy in 1950-1955 (both sexes).

life expectancies above 40 years tended to be confined to small island countries (Comoros, Cape Verde, Mauritius and Réunion) and to countries of Northern Africa. Overall, it is in those same countries that mortality decline indices of 60 per cent or more were attained, the main exceptions being Comoros with 46 per cent and Sudan with 41 per cent. In all other countries south of the Sahara the values of the mortality decline index are very low, ranging from 25 per cent in Niger to 36 per cent in Senegal, indicating that they have failed to realize most of the potential increase in life expectancy. Given that their life expectancies in 1950-1955 were lower than 40 years, the very modest gains made since then imply that they remain among the countries with the lowest life expectancies on earth. It is also noteworthy that, in the majority of these sub-Saharan African countries, gains in life expectancy have been higher for males than for females so that sex differentials in life expectancy have declined. Female to male ratios lower than one can also be observed in some countries of Northern Africa, namely, Algeria, Egypt, Sudan and Western Sahara.

TABLE II.4. LIFE EXPECTANCY AT BIRTH IN 1950-1955 AND 1995-2000 AND SELECTED INDICATORS OF TRENDS AND DIFFERENTIALS BY SEX FOR DEVELOPED COUNTRIES WITH ECONOMIES IN TRANSITION

Country or area	Both sexes (years)		Mortality decline index	Male (years)		Female (years)		e_0 ratio		Female to male ratio
	1950-1955	1995-2000		1950-1955	1995-2000	1950-1955	1995-2000	1995-2000 to 1950-1955		
								Male	Female	
Czech Republic	67.4	74.3	52.9	64.5	70.9	70.3	77.7	1.10	1.10	1.005
Ukraine	66.0	68.1	14.2	61.3	62.7	69.7	73.5	1.02	1.05	1.030
Latvia	66.0	69.6	24.8	62.5	63.7	69.0	75.4	1.02	1.09	1.071
Belarus	65.9	68.5	18.1	61.1	62.8	70.0	74.4	1.03	1.06	1.034
Slovenia	65.6	75.0	63.0	63.0	71.1	68.1	78.6	1.13	1.15	1.023
Estonia	65.3	70.0	30.6	61.7	64.3	68.3	75.6	1.04	1.11	1.061
Lithuania	64.8	71.4	42.4	61.5	66.1	67.8	76.7	1.07	1.13	1.054
Russian Federation	64.6	66.1	9.5	60.5	60.2	67.3	72.5	0.99	1.08	1.084
Slovakia	64.3	72.8	52.5	62.4	68.8	66.2	76.8	1.10	1.16	1.051
Bulgaria	64.1	70.8	41.0	62.2	67.1	66.1	74.8	1.08	1.13	1.049
Hungary	63.6	70.7	41.9	61.5	66.3	65.8	75.1	1.08	1.14	1.059
Poland	61.3	72.8	59.9	58.6	68.6	64.2	77.0	1.17	1.20	1.024
Croatia	61.2	73.3	62.9	59.0	69.3	63.2	77.3	1.17	1.22	1.042
Romania	61.1	69.8	45.2	59.4	66.5	62.8	73.3	1.12	1.17	1.043
Republic of Moldova	58.4	66.6	37.1	55.0	62.8	63.0	70.3	1.14	1.12	0.977
Yugoslavia	58.0	72.2	63.4	57.1	69.9	58.8	74.6	1.22	1.27	1.037
Albania	55.2	72.8	69.5	54.4	69.9	56.1	75.9	1.28	1.35	1.052
The former Yugoslav Republic of Macedonia	55.0	72.7	69.5	55.0	70.6	55.0	74.8	1.28	1.36	1.059
Bosnia and Herzegovina	53.8	73.3	73.0	52.6	70.5	54.8	75.9	1.34	1.39	1.033

NOTE: Countries are ordered according to life expectancy in 1950-1955 (both sexes).

Asian countries exhibit varied experiences regarding the decline of mortality (table II.6). In 1950-1955, a few of the smaller countries in Western Asia and the Pacific Rim were already far along in the transition to low mortality, but the most populous countries in the continent were still experiencing high mortality and their expectations of life were generally lower than 45 years. Excluding the successor states of the former USSR, 70 per cent of the countries listed in table II.6 attained at least 60 per cent of the potential increase in life expectancy, but most of them are small or medium-sized countries located in Western Asia or the Pacific Rim. Among the group of high achievers (those realizing 70 per cent or more of the potential rise in life expectancy), small countries of 10 million inhabitants or less in 2000 include the oil-producing countries of the Arabian Peninsula, Cyprus, Israel, Jordan, and the Occupied Palestinian Territory, as well as Brunei Darussalam, Singapore and the Special Administrative Regions of China (Hong Kong and Macao). The medium-sized countries (i.e. those with populations ranging between 10 million and 50 million) in that group are the Republic of Korea, Malaysia, Saudi Arabia and the Syrian Arab Republic. China, the only populous country in the group of high achievers saw its life expectancy rise from 40.8 years in 1950-1955 to 69.8 years in 1995-2000. All countries belonging to that group had reached life expectancy levels of 69.7 years or higher by 1995-2000, levels comparable to those typical of more developed countries.

Although life expectancy rose by at least half of the potential maximum in the vast majority of Asian countries and areas, a few lagged behind. Among them, Afghanistan, East Timor and the Lao People's Democratic Republic experienced at most 35 per cent of the maximum potential in-

TABLE II.5. LIFE EXPECTANCY AT BIRTH IN 1950-1955 AND 1995-2000 AND SELECTED INDICATORS OF TRENDS AND DIFFERENTIALS BY SEX FOR COUNTRIES OF AFRICA (EXCLUDING THOSE HIGHLY AFFECTED BY THE HIV/AIDS EPIDEMIC)

Country or area	Both sexes (years)		Mortality decline index	Male (years)		Female (years)		e_0 ratio		Female to male ratio
	1950-1955	1995-2000		1950-1955	1995-2000	1950-1955	1995-2000	1995-2000 to 1950-1955		
								Male	Female	
Réunion	52.6	73.8	76.1	49.7	69.4	55.6	78.3	1.40	1.41	1.009
Mauritius	51.0	70.7	66.8	49.7	66.9	52.3	74.8	1.34	1.43	1.064
Cape Verde	48.5	68.9	63.9	47.0	65.5	50.0	71.3	1.39	1.43	1.023
Tunisia	44.6	69.5	69.4	44.1	68.4	45.1	70.7	1.55	1.57	1.011
Algeria	43.1	68.9	69.0	42.1	67.5	44.2	70.3	1.60	1.59	0.992
Morocco	42.9	66.6	63.2	41.9	64.8	43.9	68.5	1.55	1.56	1.009
Libyan Arab Jamahiriya	42.9	70.0	72.1	41.9	68.3	43.9	72.2	1.63	1.64	1.009
Egypt	42.4	66.3	62.8	41.2	64.7	43.6	67.9	1.57	1.56	0.991
Comoros	40.7	58.8	45.5	39.5	57.4	42.0	60.2	1.45	1.43	0.987
Sudan	37.7	55.0	40.5	36.3	53.6	39.1	56.4	1.48	1.44	0.977
Madagascar	36.7	51.6	34.2	36.4	50.5	37.0	52.8	1.39	1.43	1.029
Senegal	36.5	52.3	36.0	35.5	50.5	37.5	54.2	1.42	1.45	1.017
Mauritania	35.5	50.5	33.3	34.0	48.9	37.1	52.1	1.44	1.40	0.976
Western Sahara	35.5	61.4	57.6	34.0	59.8	37.1	63.1	1.76	1.70	0.967
Equatorial Guinea	34.5	50.0	33.8	33.0	48.4	35.0	51.6	1.47	1.47	1.006
Somalia	33.0	46.9	29.4	31.5	45.4	34.5	48.5	1.44	1.41	0.977
Niger	32.2	44.2	24.9	31.9	43.9	32.5	44.5	1.38	1.37	0.992
Guinea	31.0	46.5	31.3	30.5	46.0	31.5	47.0	1.51	1.49	0.989

NOTE: Countries are ordered according to life expectancy in 1950-1955 (both sexes).

crease in life expectancy. These three countries had in 1995-2000 the lowest life expectancy levels in the continent. Bangladesh, the Democratic People's Republic of Korea, Iraq and Nepal were also among the countries registering modest values of the mortality decline index (below 50 per cent). For the Democratic People's Republic of Korea and Iraq the low values of the index resulted mainly from increasing mortality in recent times. In both cases, life expectancy dropped by about 10 per cent from 1985-1990 to 1995-2000.

The group of countries constituted by the Asian successor States of the former USSR had, for the most part, moderate levels of life expectancy in 1950-1955. By 1995-2000 their life expectancies ranged from 65.4 years in Turkmenistan to 72.4 years in Armenia being therefore moderate to high. However, with the exception of Georgia and Azerbaijan, the Asian successor States of the former USSR have not achieved more than half of the potential gains in life expectancy. Consequently, within Asia, they deviate from the pattern common to other countries that started with similarly high life expectancies in the 1950s. Albeit to a lesser extent than their European counterparts, the Asian successor States of the former USSR have also shown some signs of underachievement in terms of mortality reduction.

An interesting feature of the mortality decline in the Asian successor States of the former USSR is that in all of them the increases in life expectancy have been higher among males than among females; consequently, sex differentials in life expectancy have declined over the 1950-2000 period. Among the other Asian countries listed in table II.6, 35 per cent have experienced declining sex differentials in life expectancy, including Jordan, Kuwait, Lebanon, the Occupied Palestinian

TABLE II.6. LIFE EXPECTANCY AT BIRTH IN 1950-1955 AND 1995-2000 AND SELECTED INDICATORS OF TRENDS AND DIFFERENTIALS BY SEX FOR COUNTRIES OF ASIA (EXCLUDING THOSE HIGHLY AFFECTED BY THE HIV/AIDS EPIDEMIC)

Country or area	Both sexes (years)		Mortality decline index	Male (years)		Female (years)		e_0 ratio 1995-2000 to 1950-1955		Female to male ratio
	1950-1955	1995-2000		1950-1955	1995-2000	1950-1955	1995-2000	Male	Female	
Cyprus	67.0	77.8	79.9	65.1	75.5	69.0	80.0	1.16	1.16	1.000
Israel	65.4	78.3	85.7	64.4	76.3	66.4	80.2	1.19	1.21	1.018
China, Hong Kong SAR	61.0	79.1	93.1	57.2	76.5	64.9	82.0	1.34	1.26	0.945
Singapore	60.4	77.1	83.2	58.8	74.9	62.1	79.3	1.27	1.28	1.004
Brunei Darussalam	60.4	75.5	75.3	59.6	73.4	61.1	78.1	1.23	1.28	1.038
Lebanon	56.0	72.6	68.0	54.3	71.1	57.7	74.1	1.31	1.28	0.981
Kuwait	55.8	75.9	81.3	54.1	74.1	57.5	78.2	1.37	1.36	0.993
Sri Lanka	55.5	71.6	64.4	56.2	69.0	54.7	74.7	1.23	1.36	1.112
China, Macau SAR	54.0	78.5	92.7	51.5	76.1	56.5	80.8	1.48	1.43	0.968
Bahrain	51.0	72.9	74.2	49.6	71.1	52.5	75.3	1.43	1.43	1.001
Dem. People's Rep. of Korea	49.0	63.1	44.9	48.0	60.5	50.0	66.0	1.26	1.32	1.049
Malaysia	48.5	71.9	73.4	47.0	69.6	50.0	74.5	1.48	1.49	1.007
Qatar	48.0	68.9	64.4	46.7	68.1	49.3	70.6	1.46	1.43	0.981
United Arab Emirates	48.0	74.6	82.0	46.7	73.3	49.3	77.6	1.57	1.57	1.003
Philippines	47.8	68.6	63.6	46.0	66.5	49.6	70.7	1.45	1.43	0.986
Republic of Korea	47.5	74.3	81.5	46.0	70.6	49.0	78.1	1.53	1.59	1.039
Syrian Arab Republic	46.0	70.5	71.1	44.8	69.4	47.2	71.6	1.55	1.52	0.979
Iran (Islamic Republic of)	44.1	68.0	65.7	44.1	67.3	44.1	68.8	1.52	1.56	1.022
Iraq	44.0	58.7	40.3	43.1	57.2	44.9	60.3	1.33	1.34	1.012
Turkey	43.6	69.0	69.0	42.0	66.5	45.2	71.7	1.58	1.59	1.002
Jordan	43.2	69.7	71.0	42.2	68.5	44.3	71.0	1.62	1.60	0.988
Occupied Palestinian Territory	43.2	71.4	75.7	42.2	69.8	44.3	73.0	1.65	1.65	0.997
Mongolia	42.2	61.9	51.3	41.0	59.9	43.5	63.9	1.46	1.47	1.005
Pakistan	41.0	59.0	45.6	42.3	59.2	39.8	58.9	1.40	1.48	1.058
China	40.8	69.8	73.2	39.3	67.9	42.3	72.0	1.73	1.70	0.985
Viet Nam	40.4	67.2	66.9	39.1	64.9	41.8	69.6	1.66	1.67	1.003
Saudi Arabia	39.9	70.9	76.5	39.1	69.9	40.7	72.2	1.79	1.77	0.992
Maldives	38.9	65.4	63.8	40.1	66.3	37.6	64.5	1.65	1.72	1.038
Lao People's Dem. Republic	37.8	52.5	34.4	36.5	51.3	39.2	53.8	1.40	1.37	0.977
Indonesia	37.5	65.1	64.3	36.9	63.3	38.1	67.0	1.72	1.76	1.025
Bangladesh	36.6	58.1	49.1	38.3	58.1	34.9	58.2	1.52	1.67	1.099
Oman	36.4	70.5	77.3	35.8	69.2	37.0	72.0	1.94	1.95	1.006
Nepal	36.3	57.3	47.7	36.8	57.6	35.8	57.1	1.57	1.60	1.019
Bhutan	35.2	60.7	56.4	34.5	59.5	36.0	62.0	1.72	1.72	0.999
Yemen	32.1	59.4	56.4	32.0	58.2	32.3	60.4	1.82	1.87	1.028
Afghanistan	31.9	42.5	21.8	32.0	42.3	31.7	42.8	1.32	1.35	1.021
East Timor	30.0	47.5	34.7	29.6	46.7	30.4	48.4	1.58	1.59	1.010
Successor States of the former USSR										
Armenia	64.8	72.4	48.8	61.8	69.3	67.9	75.4	1.12	1.11	0.989
Georgia	61.5	72.7	59.2	57.5	68.5	65.4	76.8	1.19	1.17	0.985
Azerbaijan	61.3	71.0	50.5	57.4	67.2	65.0	74.5	1.17	1.15	0.978
Kazakhstan	56.5	64.1	31.8	51.7	58.6	61.9	70.0	1.13	1.13	0.997
Uzbekistan	56.4	68.3	49.6	53.2	65.3	59.9	71.3	1.23	1.19	0.969
Tajikistan	55.7	67.2	46.3	53.3	64.2	58.4	70.2	1.21	1.20	0.997
Kyrgyzstan	55.4	66.9	46.1	51.3	62.8	59.8	71.1	1.23	1.19	0.970
Turkmenistan	53.0	65.4	45.0	49.7	61.9	56.6	68.9	1.25	1.22	0.977

NOTE: Countries are ordered according to life expectancy in 1950-1955 (both sexes).

Territory, Qatar, Saudi Arabia and the Syrian Arab Republic in Western Asia; China and its Special Administrative Regions (Hong Kong and Macao) in Eastern Asia; the Lao People's Democratic Republic and the Philippines in South-eastern Asia; and Bhutan in South-central Asia.

In comparison to the countries of Asia, those of Latin America and the Caribbean tended to have higher life expectancies in 1950-1955, ranging from 40.4 years in Bolivia to 66.1 years in Uruguay (table II.7). Furthermore, over three quarters of the countries presented in table II.7 experienced increases in life expectancy amounting to at least 65 per cent of the potential maximum. Thus, by 1995-2000, 20 of the 27 countries listed in table II.7 had expectations of life above 70 years. Over half of the countries achieving the largest gains in life expectancy (70 per cent or more of the potential maximum) are concentrated in the Caribbean. They are accompanied by Belize, Chile, Costa

TABLE II.7. LIFE EXPECTANCY AT BIRTH IN 1950-1955 AND 1995-2000 AND SELECTED INDICATORS OF TRENDS AND DIFFERENTIALS BY SEX FOR COUNTRIES OF LATIN AMERICA AND THE CARIBBEAN (EXCLUDING THOSE HIGHLY AFFECTED BY THE HIV/AIDS EPIDEMIC)

	Both sexes (years)			*Male (years)*		*Female (years)*		*e_0 ratio*		
								1995-2000 to 1950-1955		
Country or area	*1950-1955*	*1995-2000*	*Mortality decline index*	*1950-1955*	*1995-2000*	*1950-1955*	*1995-2000*	*Male*	*Female*	*Female to male ratio*
Uruguay	66.1	73.9	54.6	63.3	70.5	69.4	78.0	1.11	1.12	1.009
Puerto Rico	64.3	74.9	65.8	62.7	70.4	66.0	79.6	1.12	1.21	1.075
Paraguay	62.6	69.6	39.3	60.7	67.5	64.7	72.0	1.11	1.11	1.001
Argentina	62.5	72.9	57.9	60.4	69.7	65.1	76.8	1.15	1.18	1.022
Netherlands Antilles	60.5	75.5	75.2	59.1	72.5	61.6	78.4	1.23	1.27	1.037
Cuba	59.3	75.7	77.3	57.8	74.2	61.3	78.0	1.28	1.27	0.991
Trinidad and Tobago	59.1	73.8	68.8	58.2	71.5	59.9	76.2	1.23	1.27	1.035
Jamaica	58.5	74.8	74.3	56.9	72.9	60.2	76.8	1.28	1.28	0.996
Belize	57.7	73.6	70.0	57.1	72.4	58.3	75.0	1.27	1.29	1.014
Costa Rica	57.3	76.0	80.9	56.0	74.3	58.6	78.9	1.32	1.35	1.017
Barbados	57.2	76.4	82.3	55.0	73.7	59.5	78.7	1.34	1.32	0.987
Martinique	56.6	78.8	93.2	55.0	75.5	58.1	82.0	1.37	1.41	1.028
Guadeloupe	56.5	77.3	86.6	55.0	73.6	58.1	80.9	1.34	1.39	1.041
Suriname	56.0	70.1	57.7	54.4	67.5	57.7	72.7	1.24	1.26	1.015
Panama	55.2	73.6	72.8	54.4	71.8	56.2	76.4	1.32	1.36	1.028
Venezuela	55.1	72.4	68.3	53.8	70.0	56.6	75.7	1.30	1.34	1.029
Chile	54.7	74.9	78.5	52.9	72.3	56.8	78.3	1.37	1.38	1.009
Saint Lucia	54.1	73.0	71.7	52.7	70.3	55.3	75.6	1.33	1.37	1.024
French Guiana	53.3	75.0	79.8	50.3	71.4	56.9	79.3	1.42	1.39	0.982
Colombia	50.6	70.4	66.3	49.0	67.3	52.3	74.3	1.37	1.42	1.033
Mexico	50.6	72.2	72.2	48.9	69.5	52.5	75.5	1.42	1.44	1.011
Ecuador	48.4	69.5	65.9	47.1	67.3	49.6	72.5	1.43	1.46	1.022
El Salvador	45.3	69.1	67.8	44.1	66.5	46.5	72.5	1.51	1.56	1.035
Peru	43.9	68.0	66.0	42.9	65.9	45.0	70.9	1.54	1.57	1.024
Nicaragua	42.3	67.7	66.6	40.9	65.7	43.7	70.4	1.61	1.61	1.002
Guatemala	42.0	64.0	57.3	41.8	61.4	42.3	67.2	1.47	1.59	1.082
Bolivia	40.4	61.4	52.4	38.5	59.8	42.5	63.2	1.55	1.49	0.957

NOTE: Countries are ordered according to life expectancy in 1950-1955 (both sexes).

Rica, French Guiana, Mexico and Panama, all of which achieved significant reductions in mortality. Among them, Mexico is not only the most populous but also the one with the lowest life expectancy in 1950-1955 (50.6 years). The sharp rise in life expectancy experienced by Mexico places it near the ranks of Argentina and Uruguay in 1995-2000, two countries that had already reached very low mortality by 1950-1955 but whose gains in life expectancy thereafter have been amongst the lowest in the region (amounting, respectively, to 58 per cent and 55 per cent of the potential maximum). Bolivia, Guatemala and Suriname also had similar values of the mortality decline index (between 52 per cent and 57 per cent), and Paraguay clearly made the least progress in reducing mortality, achieving just 39 per cent of the potential rise in life expectancy. Yet, among those countries whose mortality has been declining at a slower pace, only Bolivia and Guatemala still had an expectation of life below 65 years in 1995-2000. Haiti and Guyana are also among the countries with lower expectations of life and slow improvements in survivorship, largely caused by the impact of HIV/AIDS. They will be considered among the countries highly affected by the epidemic. In most countries of Latin America and the Caribbean the increase of life expectancy has been larger among women than among men, so that sex differentials in life expectancy have tended to increase. The only exceptions are Barbados, Bolivia, French Guiana, Cuba and Jamaica, where males have registered higher gains in terms of life expectancy than females.

In the developing countries of Oceania increases in life expectancy have been substantial, as shown in table II.8. With the exception of Fiji and Papua New Guinea, all countries in the region experienced an increase of life expectancy higher than 60 per cent of the potential maximum. By 1995-2000, seven of the eight developing countries in the region had expectations of life above 65 years, with three of them having expectations of life above 70 years. Only Papua New Guinea still had a life expectancy below 60 years (55.6 years). The life expectancy of males had risen more than that of females in five of the eight countries listed in table II.8, so that sex differentials in life expectancy had declined. However, in French Polynesia, New Caledonia and to a lesser extent in the Solomon Islands, an increase in sex differentials has taken place.

The last group considered is that of countries where the prevalence of HIV/AIDS has reached significant levels and for which projections are made taking explicit account of the epidemic's effect on mortality levels and population dynamics. The 45 countries in this group are listed in table II.9. They include 35 countries in sub-Saharan Africa, four in Asia (Cambodia, India, Myanmar and Thailand), and six in Latin America

TABLE II.8. LIFE EXPECTANCY AT BIRTH IN 1950-1955 AND 1995-2000 AND SELECTED INDICATORS OF TRENDS AND DIFFERENTIALS BY SEX FOR COUNTRIES OF OCEANIA

	Both sexes (years)			*Male (years)*		*Female (years)*		*e_0 ratio*		
								1995-2000 to 1950-1955		
Country or area	*1950-1955*	*1995-2000*	*Mortality decline index*	*1950-1955*	*1995-2000*	*1950-1955*	*1995-2000*	*Male*	*Female*	*Female to male ratio*
Guam	57.0	73.5	70.3	55.4	71.4	59.7	76.0	1.29	1.27	0.988
Fiji	52.5	68.4	56.8	50.8	66.6	55.0	70.3	1.31	1.28	0.975
New Caledonia	51.4	74.0	77.6	50.0	71.5	53.0	76.7	1.43	1.45	1.012
French Polynesia	48.8	71.7	72.3	48.0	69.4	50.0	74.4	1.45	1.49	1.030
Solomon Islands	45.4	67.4	62.8	44.9	66.4	46.4	68.7	1.48	1.48	1.001
Samoa	46.0	68.5	65.2	43.0	65.4	49.6	72.0	1.52	1.45	0.954
Vanuatu	42.0	67.2	65.6	40.6	66.0	43.5	69.0	1.62	1.59	0.978
Papua New Guinea	34.7	55.6	45.7	33.8	54.8	35.7	56.7	1.62	1.59	0.980

NOTE: Countries are ordered according to life expectancy in 1950-1955 (both sexes).

TABLE II.9. LIFE EXPECTANCY AT BIRTH IN 1950-1955 AND 1995-2000 AND SELECTED INDICATORS OF TRENDS AND DIFFERENTIALS BY SEX FOR COUNTRIES HIGHLY AFFECTED BY THE HIV/AIDS EPIDEMIC

Country or area	Both sexes (years)			Male (years)		Female (years)		e_0 ratio 1995-2000 to 1950-1955		Female to male ratio
	1950-1955	1995-2000	Mortality decline index	1950-1955	1995-2000	1950-1955	1995-2000	Male	Female	
Bahamas	59.8	69.1	44.6	58.3	64.8	61.2	73.5	1.11	1.20	1.080
Guyana	52.3	63.7	40.6	50.8	59.8	53.9	67.8	1.18	1.26	1.066
Thailand	52.0	69.6	61.7	49.8	66.7	54.3	72.6	1.34	1.34	1.000
Brazil	50.9	67.2	55.0	49.3	63.5	52.7	71.4	1.29	1.35	1.051
Zimbabwe	47.4	42.9	-13.6	45.9	43.2	49.1	42.7	0.94	0.87	0.925
Dominican Republic	45.9	67.3	61.9	44.7	65.3	47.3	69.9	1.46	1.48	1.013
South Africa	45.0	56.7	32.9	44.0	53.9	46.0	59.5	1.22	1.29	1.056
Botswana	42.5	44.4	5.0	40.9	43.8	44.1	44.7	1.07	1.01	0.945
Ghana	42.0	56.3	37.2	40.5	55.0	43.6	57.6	1.36	1.32	0.974
Honduras	41.8	65.6	61.6	40.5	63.2	43.2	68.7	1.56	1.59	1.021
Kenya	40.9	52.2	28.5	39.0	51.2	43.0	53.2	1.31	1.24	0.943
Rwanda	40.0	39.4	-1.4	38.5	38.7	41.6	40.2	1.01	0.97	0.962
Uganda	40.0	41.9	4.8	38.5	41.4	41.6	42.5	1.08	1.02	0.950
Cambodia	39.4	56.5	41.7	38.1	54.3	40.8	58.5	1.42	1.43	1.007
Dem. Rep. of the Congo	39.1	50.5	27.7	37.5	49.2	40.6	51.9	1.31	1.28	0.974
Burundi	39.0	40.6	3.8	37.5	39.6	40.6	41.5	1.06	1.02	0.968
Namibia	38.7	45.1	15.3	37.5	44.9	40.0	45.3	1.20	1.13	0.946
India	38.7	62.3	56.5	39.4	61.9	38.0	62.6	1.57	1.65	1.048
Congo	38.6	50.9	29.4	36.1	48.8	41.3	53.1	1.35	1.29	0.952
Lesotho	38.5	51.2	30.1	36.0	50.7	41.0	51.6	1.41	1.26	0.894
Gabon	38.0	52.4	34.0	36.5	51.2	39.6	53.7	1.40	1.36	0.968
Zambia	37.8	40.5	6.3	36.3	40.9	39.4	40.1	1.13	1.02	0.904
Haiti	37.6	52.0	33.6	36.3	49.1	38.9	55.0	1.35	1.41	1.045
Liberia	37.5	48.1	24.6	36.0	47.1	39.0	49.0	1.31	1.26	0.962
United Rep. of Tanzania	37.0	51.1	32.5	35.5	50.0	38.6	52.3	1.41	1.36	0.964
Myanmar	36.8	55.8	43.6	35.6	53.6	38.2	58.3	1.51	1.53	1.014
Nigeria	36.5	51.3	33.6	35.0	51.0	38.0	51.5	1.46	1.36	0.932
Malawi	36.2	40.7	10.2	35.8	40.7	36.7	40.7	1.14	1.11	0.978
Togo	36.0	51.3	34.5	34.5	50.1	37.5	52.6	1.45	1.40	0.965
Côte d'Ivoire	36.0	47.7	26.4	34.5	47.4	37.5	48.1	1.37	1.28	0.935
Cameroon	36.0	50.0	31.4	34.5	49.1	37.5	50.8	1.42	1.36	0.954
Eritrea	35.9	51.5	35.0	34.5	50.1	37.4	53.0	1.45	1.42	0.978
Swaziland	35.6	50.8	33.8	34.2	49.3	37.0	52.2	1.44	1.41	0.978
Central African Republic	35.5	44.3	19.6	33.0	42.7	38.0	46.0	1.29	1.21	0.937
Mali	34.3	50.9	35.9	32.9	49.8	35.8	51.8	1.52	1.45	0.955
Benin	33.9	53.5	42.0	32.5	51.8	35.6	55.3	1.59	1.55	0.974
Mozambique	33.5	40.6	15.1	32.0	39.4	35.0	41.8	1.23	1.19	0.970
Djibouti	33.0	45.5	26.4	31.5	43.9	34.5	46.9	1.39	1.36	0.975
Ethiopia	32.9	44.5	24.3	31.4	43.6	34.4	45.4	1.39	1.32	0.952
Chad	32.5	45.2	26.4	31.1	43.9	34.0	46.4	1.41	1.37	0.967
Guinea-Bissau	32.5	44.1	24.2	31.1	42.7	34.0	45.5	1.38	1.34	0.973
Burkina Faso	30.7	45.3	29.3	29.3	44.2	32.1	46.2	1.51	1.44	0.954
Angola	30.0	44.6	29.0	28.6	43.3	31.5	46.0	1.51	1.46	0.967
Gambia	30.0	45.4	30.5	28.6	44.0	31.5	46.8	1.54	1.49	0.967
Sierra Leone	30.0	37.3	14.5	28.6	36.0	31.5	38.6	1.26	1.23	0.974

NOTE: Countries are ordered according to life expectancy in 1950-1955 (both sexes).

and the Caribbean (Bahamas, Brazil, the Dominican Republic, Guyana, Haiti and Honduras). As shown in table II.9, countries in this group tended to have very low life expectancies in 1950-1955, with 70 per cent of them having an expectation of life below 40 years. Although over the course of the next 30 or 35 years increases in life expectancy were the rule, the emergence of HIV in the 1970s or 1980s and its dissemination over time, reaching significant prevalence levels amongst the adult populations of affected countries, have led either to outright reductions of life expectancy or to smaller gains. Consequently, 60 per cent of the affected countries achieved less than one third of the maximum potential increase (table II.9). In fact, only in three countries has life expectancy at birth risen by more than 60 per cent of the potential maximum: the Dominican Republic, Honduras and Thailand. Seven other countries–Bahamas, Benin, Brazil, Cambodia, Guyana, India and Myanmar–have made moderate progress, having achieved at least 40 per cent of the potential maximum increase in life expectancy. However, all of those 10 countries still had relatively low HIV prevalence levels in 1999, ranging from 0.6 per cent in Brazil to 4.1 in the Bahamas. In sharp contrast, Rwanda and Zimbabwe have experienced a reduction of life expectancy. In the case of Zimbabwe, this reduction is mostly the result of high HIV prevalence, whereas in Rwanda, the decline in life expectancy has been brought about not only by the impact of HIV/AIDS but also as a consequence of internal conflict.

In most countries affected by the HIV/AIDS epidemic, the increase of life expectancy from 1950-1955 to 1995-2000 has been larger among men than among women, so that sex differentials in life expectancy have tended to decrease. Indeed, as observed in table II.9, the female to male ratios of the 1950-1955 and 1995-2000 ratios of life expectancy are generally lower than one. This is particularly the case in sub-Saharan African countries where the epidemic has reached significant proportions and where HIV incidence rates are higher among females than among males. Eight of the ten countries with the lowest male to female ratios (below 0.95) had HIV prevalence above 10 per cent in 1999. Except for the Republic of South Africa, all the countries that have experienced a sharper improvement in life expectancy among females than among males (i.e. where the female to male ratios are greater than one) are located outside of Africa. Those countries tend to be characterized by higher prevalence of HIV/AIDS among males than among females.

B. FUTURE PROSPECTS FOR THE TRANSITION TO LOW MORTALITY

According to the *2000 Revision*, by 1995-2000 the world population had achieved an expectation of life at birth of 65 years, which is projected to increase to 66 years by 2000-2005 and to reach 72.4 years in 2025-2030 (table II.10). By the end of the projection period, in 2045-2050, the life expectancy of the world population is expected to rise further to 76 years. Such increases in the world's life expectancy levels result from sustained increases in survivorship in most countries as well as at the regional level. For each major area and region, table II.10 displays the projected life expectancy for selected periods and the index of mortality decline, which was calculated by setting $e_0(1)$ equal the expectation of life at birth in 1995-2000, $e_0(2)$ equal to the expectation of life at birth in a particular period, and $e_0(M)$ equal to 88 years, the highest life expectancy reached by a country in 2045-2050 (Japan in this case). Therefore, for each major area or region, the indices listed under the last three columns of table II.10 indicate the relative progress projected in the rise of life expectancy over a specific period in relation to the potential maximum increase up to 2045-2050.

At the world level, reaching a life expectancy of 76 years in 2045-2050 is equivalent to achieving 48 per cent of the maximum increase possible, and attaining a life expectancy of 72.4 years in 2025-2030 represents the realization of 32 per cent of that maximum decline. In other words, 67 per cent of the decline expected by the end of the projection period will have already been reached by 2025-2030, a figure 7 percentage points higher than the proportion of the decline that would have been expected if increases in life expectancy had followed a linear trend (in such a case, 60 per cent of the projected decline would have occurred by 2025-2030). In fact, over 60 per cent of the expected increase in life expectancy will occur by

TABLE II.10. LIFE EXPECTANCY AT BIRTH AND CORRESPONDING MORTALITY DECLINE INDEX BY MAJOR AREA AND REGION FOR SELECTED PERIODS, 1995-2050

Major area or region	e_0 (years)				Mortality decline index*		
	1995-2000	2000-2005	2025-2030	2045-2050	1995-2000 to 2000-2005	1995-2000 to 2025-2030	1995-2000 to 2045-2050
World	65.0	66.0	72.4	76.0	4.4	32.1	48.1
More developed regions	74.9	75.6	80.0	82.1	5.5	39.1	55.2
Less developed regions	62.9	64.1	70.9	75.0	4.6	32.1	48.4
Least developed countries	50.3	51.4	62.8	69.7	2.9	33.1	51.4
Less developed regions without the least developed countries	65.5	66.8	73.1	76.6	5.7	33.8	49.4
Europe	73.2	73.7	78.4	80.8	3.6	35.2	51.4
Eastern Europe	68.2	68.4	74.6	77.8	0.7	32.4	48.6
Northern Europe	76.7	77.7	81.0	82.7	8.8	38.1	53.4
Southern Europe	77.0	77.6	80.2	81.9	6.1	29.2	44.5
Western Europe	77.7	78.5	81.6	83.5	8.1	37.7	56.4
Northern America	76.7	77.7	81.1	82.7	8.4	38.8	52.9
Oceania	73.5	74.4	78.4	80.6	6.0	33.6	48.8
Australia/New Zealand	78.4	79.0	81.2	82.8	5.6	29.3	46.3
Melanesia	58.7	60.6	69.7	74.4	6.6	37.7	53.7
Micronesia	71.8	73.1	77.4	79.5	7.8	34.9	47.5
Polynesia	70.3	71.9	76.9	79.1	8.8	37.3	50.0
Africa	51.4	51.3	62.0	69.5	-0.1	29.1	49.6
Eastern Africa	45.7	45.4	58.3	67.2	-0.6	29.8	51.0
Middle Africa	48.9	50.0	61.4	69.0	2.9	32.1	51.5
Northern Africa	64.6	66.4	73.4	77.0	7.7	37.6	53.0
Southern Africa	55.4	46.4	50.5	66.2	-27.7	-14.9	33.2
Western Africa	50.0	51.3	61.9	69.0	3.3	31.5	50.1
Asia	65.8	67.4	73.9	77.1	7.3	36.8	51.2
Eastern Asia	70.9	72.3	77.3	79.7	8.1	37.5	51.3
South-central Asia	61.5	63.3	70.9	74.9	7.0	35.7	50.9
South-eastern Asia	65.3	67.0	74.0	77.3	7.2	38.2	52.8
Western Asia	67.9	70.0	75.7	78.5	10.5	39.2	53.0
Latin America and the Caribbean	69.3	70.4	75.0	77.8	5.8	30.9	45.5
Caribbean	67.5	68.1	71.8	75.1	2.7	20.8	37.3
Central America	71.0	71.9	76.0	78.3	5.1	29.3	43.0
South America	68.9	70.1	75.0	77.8	6.3	32.2	46.8

*For a definition of the mortality decline index, see text, p. 66.

2025-2030 in all regions except Southern Africa, Eastern Africa and the Caribbean.

The relatively high life expectancy at birth projected for the world as whole in 2045-2050 is associated with a significant reduction of the difference between the life expectancies of the more and the less developed regions, from 11.9 years in 1995-2000 to 7.1 years in 2045-2050. By 2045-2050, the expectation of life in more developed regions is expected to be 82.1 years compared to 75 years in less developed regions. Among the less developed regions, the group of least developed countries will continue to be characterized by a lower life expectancy (69.7 years), but also in this case, the gap in life expectancy between the least developed countries and the rest of the developing world is expected to narrow considerably. According to the mortality decline index, both the least developed countries and the less developed regions will attain a lower proportion of the maximum potential increase of life expectancy than the more developed regions and all three country groupings are expected to realize more than 60 per cent of the projected increase by 2025-2030.

At the regional level, Western Europe is expected to achieve the highest life expectancy in 2045-2050 (83.5 years), and thus to realize 56 per cent of the maximum potential increase in life expectancy, the highest mortality decline index amongst all regions. The other more developed regions are expected to attain values ranging from 44 per cent in Southern Europe to 53 per cent in Northern America and Northern Europe. By 2045-2050, the expectations of life in Australia/New Zealand, Northern America, Northern Europe and Southern Europe are all expected to be within the narrow range of 81.9 to 82.8 years. Eastern Europe is the only region of the developed world whose life expectancy at birth is not projected to rise above 80 years by 2045-2050.

Among the less developed regions, the highest life expectancy projected for 2045-2050 is that of Eastern Asia (79.7 years), with Micronesia attaining second place (79.5 years). No region in the developing world is expected to reach a life expectancy higher than 80 years by the end of the projection period. However, eleven of the fifteen regions in the developing world are expected to have life expectancies higher than 74 years by 2045-2050. The four regions that are not expected to reach such high levels are all those in sub-Saharan Africa where life expectancy in 2045-2050 is projected to remain below 70 years.

In terms of the mortality decline index, some developing regions are expected to register fairly significant gains in life expectancy by 2045-2050. Indeed, except for Southern Africa, life expectancy in all the other African regions is expected to increase by 50 per cent of the potential maximum between 1995-2000 and 2045-2050, achieving therefore higher mortality decline indices than other less developed regions or even some developed ones. All Asian regions, as well as Melanesia and Polynesia, are also expected to attain 50 per cent or more of the maximum potential increase of life expectancy by 2045-2050. In contrast, all regions of Latin America and the Caribbean, as well as Micronesia and Southern Africa are expected to register lower mortality decline indices, amounting in all cases to values below 50 per cent of the potential maximum. In terms of life expectancy, however, some of the regions recording the lower mortality decline indices are nevertheless expected to reach some of the higher life expectancies in 2045-2050, mainly because they are already experiencing fairly low mortality levels today. Thus, the regions of Latin America and the Caribbean are projected to have life expectancies ranging from 75.1 to 78.3 years by 2045-2050, and Micronesia is projected to reach one of the highest life expectancies in the developing world (79.5 years). The lowest life expectancies in 2045-2050 are expected in the regions of sub-Saharan Africa. Indeed, both Eastern Africa and Southern Africa are expected to experience decreasing life expectancies between 1995-2000 and 2000-2005, with mortality decline indices of –1 per cent and –28 per cent, respectively. Clearly, the prospects for Southern Africa are dire since it is the only region expected to have a lower life expectancy in 2025-2030 than in 1995-2000. As a consequence of these adverse trends in the medium-term future and despite the recovery projected after 2030, Southern Africa will remain the region with the lowest life expectancy on earth in 2045-2050. The impact of the HIV/AIDS epidemic is primarily responsible for the expected

decline and slow recovery of the life expectancy in Southern Africa. HIV/AIDS also has an effect, though milder, in dampening the rise of life expectancy in other regions of sub-Saharan Africa.

Levels of life expectancy at birth are very much influenced by levels of mortality in childhood, especially when these are high. Therefore, to assess changes in adult mortality it is useful to analyse future trends in terms of life expectancy at age 15. Table II.11 shows values similar to those presented in table II.10 but with respect to e_{15}. In this case, the maximum value of e_{15} used to calculate the index of mortality decline is 73.3 years (i.e., the maximum level of life expectancy at age 15 projected among all countries for the period 2045-2050, which corresponds once more to Japan). In general, future trends with respect to life expectancy at age 15 are similar to those already noted with respect to life expectancy at birth. All more developed regions except Eastern Europe reach higher e_{15} levels by the end of the projection period than regions in the less developed world. Among the less developed regions, e_{15} tends to be fairly high for the regions of Asia and Latin America and the Caribbean, as well as for Northern Africa, but considerably lower for the regions of sub-Saharan Africa, most of which experience a decline of e_{15} between 1995-2000 and 2000-2005 because of the impact of HIV/AIDS. Southern Africa is expected to register the sharpest reduction of e_{15} during that period and to be the only region to have an e_{15} below 40 years in 2025-2030. Nevertheless, with a projected decline of HIV/AIDS prevalence, Southern Africa is expected to see its e_{15} level rise above 50 years by 2045-2050, a level that had already been reached in 1990-1995.

At the country level, future trends in life expectancy are considerably more varied. The extent of such variation can be gauged by considering the 20 countries with the highest and the 20 countries with the lowest life expectancies at birth for different periods (see table II.12). For all periods considered, the 20 countries or areas with the highest life expectancies are mainly developed countries with market economies. However, among those 20 countries, five or six, depending on the period, belong to the developing world. These include small countries or areas in the Pacific Rim such as Singapore or the Special Administrative Regions of China (Hong Kong and Macao), overseas French Departments such as Guadeloupe and Martinique, and Cyprus and Israel. Over the course of time, Japan maintains its lead as the country with the highest life expectancy at birth, while other countries tend to move up and down the ranks, some joining this high longevity group while others leave it. Interestingly, the G-7 countries do not necessarily belong to the group of countries with the highest life expectancies. Germany and the United Kingdom, for instance, appear in the lists for 2025-2030 and 2045-2050 but not in those for earlier periods, and the United States of America does not appear in any list.

At the other end of the distribution, only developing countries appear in the lists of countries with the lowest life expectancies. Among the 25 countries appearing at least once, 24 are located in sub-Saharan Africa, the sole exception being Afghanistan. In addition, 23 are highly affected by the HIV/AIDS epidemic (all except Afghanistan and Niger) and 19 are least developed countries (all except Botswana, Kenya, Namibia, South Africa, Swaziland and Zimbabwe). The six countries that are not classified as least developed all had HIV/AIDS prevalence levels above 13 per cent in 1999. In fact, the course of the HIV/AIDS epidemic is a key determinant of the rank of countries in the list of those with the lowest life expectancies. Djibouti, for instance, with an estimated HIV/AIDS prevalence of 11.8 per cent among persons aged 15-49 in 1999, had the twentieth lowest life expectancy at birth in 1995-2000 but with the projected increase of HIV/AIDS prevalence, it is expected to rank seventh in 2000-2005 and to have the lowest life expectancy at birth in the world in 2025-2030. Lesotho and Swaziland, two countries highly affected by the HIV/AIDS epidemic, appear for the first time in the list of countries with low life expectancies in 2000-2005 and will remain there in all subsequent periods. South Africa, a country that once had life expectancy levels above 60 years, is projected to have a life expectancy lower than 50 years in 2025-2030, just above those of Lesotho and Djibouti. However, because the HIV/AIDS epidemic is projected to wane, South Africa's life expectancy is expected to rise again to its previous levels by

TABLE II.11. LIFE EXPECTANCY AT AGE 15 AND CORRESPONDING MORTALITY DECLINE INDEX BY MAJOR AREA AND REGION FOR SELECTED PERIODS, 1995-2050

Major area or region	e_{15} (years)				Mortality decline index*		
	1995-2000	2000-2005	2025-2030	2045-2050	1995-2000 to 2000-2005	1995-2000 to 2025-2030	1995-2000 to 2045-2050
World	56.9	57.3	61.0	63.2	2.8	25.1	38.6
More developed regions	60.8	61.5	65.6	67.6	5.3	38.5	54.6
Less developed regions	55.4	55.9	59.8	62.4	2.8	25.0	39.1
Least developed countries	47.1	47.1	53.9	58.0	0.0	25.8	41.5
Less developed regions without the least developed countries	56.5	57.1	60.9	63.4	3.7	26.3	41.2
Europe	59.3	59.8	64.1	66.3	3.4	34.5	50.6
Eastern Europe	54.8	54.9	60.6	63.6	0.7	31.7	47.5
Northern Europe	62.4	63.3	66.5	68.2	8.6	37.7	52.9
Southern Europe	62.9	63.5	65.8	67.4	5.5	28.0	43.3
Western Europe	63.3	64.1	67.0	68.9	7.8	37.5	56.3
Northern America	62.6	63.4	66.7	68.2	8.0	38.2	52.3
Oceania	61.6	62.2	64.9	66.5	5.4	28.3	41.8
Australia/New Zealand	64.1	64.6	66.7	68.3	5.5	28.8	45.7
Melanesia	49.5	50.9	57.4	61.0	5.7	33.0	48.3
Micronesia	58.6	59.6	63.3	65.2	7.1	32.5	45.1
Polynesia	57.3	58.6	62.9	64.9	8.1	34.8	47.3
Africa	47.1	46.0	52.5	57.6	-4.3	20.6	40.1
Eastern Africa	42.2	40.7	49.4	55.5	-4.7	23.2	43.1
Middle Africa	45.6	45.3	52.0	57.2	-1.0	23.3	42.0
Northern Africa	55.9	56.8	60.7	63.3	5.1	27.9	42.8
Southern Africa	46.5	37.2	39.2	53.4	-35.0	-27.4	25.5
Western Africa	46.7	46.7	52.7	57.4	0.2	22.6	40.1
Asia	57.2	58.1	62.0	64.1	5.7	30.0	43.2
Eastern Asia	59.6	60.5	64.1	65.8	6.8	32.9	45.8
South-central Asia	54.8	55.8	60.1	62.7	5.2	28.7	42.7
South-eastern Asia	55.5	56.4	61.0	63.5	4.7	30.6	45.1
Western Asia	57.9	59.1	62.5	64.6	7.8	30.1	43.6
Latin America and the Caribbean	57.9	58.7	62.0	64.0	5.0	26.6	39.7
Caribbean	57.3	57.6	59.5	61.8	1.6	13.9	28.2
Central America	59.5	60.0	63.0	64.7	4.3	25.4	37.7
South America	57.5	58.3	61.9	63.9	5.4	27.9	40.9

*For a definition of the mortality decline index, see text, p. 66.

TABLE II.12. TWENTY COUNTRIES OR AREAS WITH THE HIGHEST AND TWENTY COUNTRIES OR AREAS WITH THE LOWEST LIFE EXPECTANCY AT BIRTH, FOR SELECTED PERIODS, 1995-2050

Country or area	*1995-2000 (years)*	*Country or area*	*2000-2005 (years)*	*Country or area*	*2025-2030 (years)*	*Country or area*	*2045-2050 (years)*
Japan	80.5	Japan	81.5	Japan	85.6	Japan	88.0
Sweden	79.3	Sweden	80.1	China, Hong Kong SAR	82.6	China, Hong Kong SAR	84.7
China, Hong Kong SAR	79.1	China, Hong Kong SAR	79.9	Sweden	82.6	Sweden	84.6
Iceland	78.9	Iceland	79.4	Malta	82.1	Malta	84.0
Martinique	78.8	China, Macao SAR	79.3	China, Macao SAR	82.1	France	84.0
Australia	78.7	Australia	79.2	France	82.0	Belgium	83.8
Switzerland	78.6	Israel	79.2	Israel	82.0	China, Macao SAR	83.8
China, Macao SAR	78.5	Martinique	79.1	Belgium	81.8	Norway	83.7
Canada	78.5	Switzerland	79.1	Norway	81.7	Austria	83.6
Israel	78.3	France	79.0	Austria	81.7	Israel	83.5
Italy	78.2	Canada	79.0	Guadeloupe	81.5	Germany	83.4
Norway	78.1	Norway	78.9	Iceland	81.5	Iceland	83.1
Spain	78.1	Belgium	78.8	Martinique	81.5	Guadeloupe	83.1
France	78.1	Spain	78.8	Germany	81.4	United Kingdom	83.0
Greece	78.0	Italy	78.7	United Kingdom	81.4	Martinique	83.0
Belgium	77.9	Austria	78.5	Australia	81.4	Australia	83.0
Netherlands	77.9	Malta	78.5	Finland	81.4	Finland	83.0
Cyprus	77.8	Greece	78.5	Switzerland	81.3	Singapore	82.9
Austria	77.7	Netherlands	78.3	Singapore	81.3	Switzerland	82.9
Malta	77.6	Guadeloupe	78.3	Canada	81.2	Canada	82.8

Country or area	*1995-2000 (years)*	*Country or area*	*2000-2005 (years)*	*Country or area*	*2025-2030 (years)*	*Country or area*	*2045-2050 (years)*
Djibouti	45.5	Chad	46.3	Guinea	59.0	Namibia	67.3
Gambia	45.4	Niger	46.2	Central African Republic	58.8	Kenya	66.9
Burkina Faso	45.3	Uganda	46.0	Zimbabwe	58.6	Ethiopia	66.7
Chad	45.2	Angola	45.8	Kenya	58.0	South Africa	66.4
Namibia	45.1	Guinea-Bissau	45.4	Gambia	57.4	Zimbabwe	66.3
Angola	44.6	Central African Republic	44.3	Niger	56.4	Zambia	66.0
Ethiopia	44.5	Namibia	44.3	Guinea-Bissau	56.1	Guinea-Bissau	66.0
Botswana	44.4	Ethiopia	43.3	Ethiopia	56.1	Gambia	65.4
Central African Republic	44.3	Afghanistan	43.2	Rwanda	55.9	Niger	65.4
Niger	44.2	Zimbabwe	42.9	Angola	55.1	Lesotho	65.1
Guinea-Bissau	44.1	Zambia	42.2	Botswana	54.4	Angola	64.5
Zimbabwe	42.9	Rwanda	40.9	Afghanistan	53.5	Burundi	64.3
Afghanistan	42.5	Burundi	40.6	Swaziland	53.5	Rwanda	64.2
Uganda	41.9	Djibouti	40.6	Burundi	52.6	Malawi	64.0
Malawi	40.7	Sierra Leone	40.5	Malawi	52.4	Djibouti	63.3
Mozambique	40.6	Lesotho	40.2	Sierra Leone	51.4	Botswana	63.2
Burundi	40.6	Malawi	39.3	Mozambique	50.8	Mozambique	62.8
Zambia	40.5	Swaziland	38.1	South Africa	49.9	Swaziland	62.7
Rwanda	39.4	Mozambique	38.0	Lesotho	49.5	Afghanistan	62.4
Sierra Leone	37.3	Botswana	36.1	Djibouti	48.2	Sierra Leone	61.5

2045-2050 (66.4 years). Both in 2000-2005 and 2025-2030, the four countries with the lowest projected life expectancies at birth were highly affected by the HIV/AIDS epidemic in 1999, with prevalence levels above 11 per cent. Once the HIV/AIDS epidemic is brought under control, Sierra Leone, the country with the lowest life expectancy in 1995-2000, is expected to resume that position by 2045-2050.

In order to complete this discussion of future trends in mortality levels, the analysis will focus on the 20 countries with the highest and the 20 countries with the lowest expectations of life at ages 0, 15, 60 and 80 in 2045-2050 (see table II.13). Japan is at the top of the list in all four categories, with a life expectancy at birth of 88 years in 2045-2050 and an expectation of life at age 80 of 13.4 years. Because of the nearly universal rise in projected life expectancy levels and because the pace of mortality reduction is established using a model of gains in life expectancy that produces smaller increases as the level rises, the range of variation of life expectancy is narrower in 2045-2050 than it was in 1995-2000. Thus, the expectation of life at birth varies between 37.3 years and 80.5 years in 1995-2000 but is expected to range from 61.5 years to 88 years in 2045-2050 (table II.12). For the expectation of life at age 15 the equivalent comparison is between a range of 34.4 years to 66 years in 1995-2000 to 50.7 years and 73.3 years at the end of the projection period. In both cases, the magnitude of the increase of the upper limit is considerably less than that of the lower limit because the reduction of mortality achieved by countries with very low mortality as of 1995-2000 was already quite substantial.

Somewhat more important gains in relative terms are noticeable with respect to the upper values for the expectation of life at ages 60 or 80. For age 60, the range of variation changes from 13.1 years to 23.6 years in 1995-2000 to 16.9 years and 29.5 years in 2045-2050, which implies an increase of 25 per cent in the upper limit (from 23.6 years to 29.5 years). With lower and upper limits passing from 3.2 years and 9.7 years respectively in 1995-2000 to 5.1 years and 13.4 years respectively in 2045-2050, an even greater increase occurs with regard to the upper limit of life expectancy at age 80 (38 per cent). These comparisons indicate that the increases in life expectancy at advanced ages, as projected for countries that have already reached very low levels of mortality today, are considerably more marked than those projected for countries that still have moderate or high mortality.

C. From past to future: an overview

The data considered so far indicate that the mortality transition has been widespread and that, with a few exceptions, life expectancy at birth has increased in virtually every country between 1950-1955 and 1995-2000 and is expected to continue rising in most countries during the next fifty years. As a result, both the number of countries and the corresponding populations experiencing higher life expectancy levels have been increasing over time (tables II.14 and II.15). While 95 countries had a life expectancy at birth below 50 years and only six countries had a life expectancy at birth of 70 years or more in 1950-1955, the situation had changed markedly by 1995-2000, a time when 26 countries had a life expectancy below 50 years and 82 had reached life expectancy levels of 70 years or more. This shift has meant that between 1953 and 1998 the proportion of the world population living in countries with expectations of life below 50 years has been reduced by a factor of 13, passing from 60.1 per cent in 1953 to 4.6 per cent in 1998; for countries with life expectancies of 70 years or more, the proportion increased from one per cent to 23 per cent during that same period. If one includes China in this last figure, with it's life expectancy of 69.8 years, the proportion would rise to an unprecedented 44.3 per cent.

In spite of further setbacks expected over the medium-term future in countries where the HIV/AIDS epidemic has reached significant levels, the long-term prospects for the world population still show a marked increase in life expectancy. Thus, by 2025-2030 it is anticipated that just 22 countries will have an expectation of life below 60 years and that by 2045-2050 no country will be in that category (table II.14). As a result of these trends, it is projected that by 2028, 79.5 per cent of the world population will live in countries with a life expectancy of 70 years or more, a figure that is expected to reach 85.4 per cent in 2048

TABLE II.13. TWENTY COUNTRIES OR AREAS WITH THE HIGHEST AND TWENTY COUNTRIES OR AREAS WITH THE LOWEST LIFE EXPECTANCY AT BIRTH AND AT AGES 15, 60 AND 80, 2045-2050

Country or area	e_0 *(years)*	*Country or area*	e_{15} *(years)*	*Country or area*	e_{60} *(years)*	*Country or area*	e_{80} *(years)*
Japan	88.0	Japan	73.3	Japan	29.5	Japan	13.4
China, Hong Kong SAR	84.7	China, Hong Kong SAR	70.1	China, Hong Kong SAR	26.6	China, Hong Kong SAR	11.3
Sweden	84.6	Sweden	69.9	France	26.3	Martinique	11.0
Malta	84.0	Malta	69.5	Sweden	26.2	France	11.0
France	84.0	France	69.4	Belgium	26.0	Sweden	10.8
Belgium	83.8	China, Macao SAR	69.3	Malta	25.9	Singapore	10.8
China, Macao SAR	83.8	Belgium	69.2	Austria	25.8	Guadeloupe	10.7
Norway	83.7	Norway	69.1	China, Macao SAR	25.8	Belgium	10.7
Austria	83.6	Austria	69.1	Martinique	25.6	Norway	10.7
Israel	83.5	Israel	69.0	Norway	25.6	China, Macao SAR	10.6
Germany	83.4	Germany	68.8	Guadeloupe	25.5	Austria	10.6
Iceland	83.1	Guadeloupe	68.6	Germany	25.5	Malta	10.6
Guadeloupe	83.1	Martinique	68.5	Israel	25.5	Germany	10.5
United Kingdom	83.0	Iceland	68.5	Switzerland	25.3	United States of America	10.5
Martinique	83.0	United Kingdom	68.4	Canada	25.2	Israel	10.4
Australia	83.0	Australia	68.4	Iceland	25.2	Canada	10.4
Finland	83.0	Switzerland	68.3	United States of America	25.1	United Kingdom	10.3
Singapore	82.9	Singapore	68.3	Australia	25.1	Australia	10.3
Switzerland	82.9	Canada	68.3	Singapore	25.1	Iceland	10.3
Canada	82.8	Finland	68.3	Spain	25.1	Switzerland	10.3

Country or area	e_0 *(years)*	*Country or area*	e_{15} *(years)*	*Country or area*	e_{60} *(years)*	*Country or area*	e_{80} *(years)*
Namibia	67.3	Côte d'Ivoire	55.9	Malawi	19.2	Cambodia	6.7
Kenya	66.9	Guinea-Bissau	55.7	Uganda	19.2	Madagascar	6.7
Ethiopia	66.7	Gambia	55.5	Equatorial Guinea	19.1	Burundi	6.6
South Africa	66.4	Central African Republic	55.5	Djibouti	18.9	Equatorial Guinea	6.6
Zimbabwe	66.3	Ethiopia	55.0	Rwanda	18.9	Chad	6.6
Zambia	66.0	Angola	54.8	Chad	18.9	Mozambique	6.5
Guinea-Bissau	66.0	Namibia	54.7	Burundi	18.8	Nepal	6.5
Gambia	65.4	Kenya	54.3	Liberia	18.7	Bangladesh	6.5
Niger	65.4	Zambia	53.9	Papua New Guinea	18.7	Somalia	6.5
Lesotho	65.1	Zimbabwe	53.7	Somalia	18.7	Guinea-Bissau	6.4
Angola	64.5	Lesotho	53.7	Guinea	18.6	Guinea	6.4
Burundi	64.3	South Africa	53.4	Guinea-Bissau	18.5	Gambia	6.4
Rwanda	64.2	Rwanda	53.2	Mozambique	18.4	Angola	6.4
Malawi	64.0	Burundi	53.2	Gambia	18.4	Liberia	6.3
Djibouti	63.3	Sierra Leone	53.2	Senegal	18.3	Lesotho	6.3
Botswana	63.2	Malawi	53.2	Angola	18.2	Niger	6.2
Mozambique	62.8	Mozambique	52.5	Niger	18.0	Sierra Leone	6.1
Swaziland	62.7	Djibouti	52.1	Sierra Leone	17.6	East Timor	5.8
Afghanistan	62.4	Botswana	51.1	East Timor	17.6	Senegal	5.8
Sierra Leone	61.5	Swaziland	50.7	Afghanistan	16.9	Afghanistan	5.1

TABLE II.14. DISTRIBUTION OF COUNTRIES BY LEVEL OF LIFE EXPECTANCY AT BIRTH, FOR SELECTED PERIODS, 1950-2050

Level of life expectancy at birth (years)	*1950-1955*	*1995-2000*	*2000-2005*	*2025-2030*	*2045-2050*
		Number of countries or areas			
80+	0	1	2	30	52
70-79	6	81	95	104	101
60-69	45	49	39	31	34
50-59	41	30	23	19	0
40-49	42	24	24	3	0
30-39	52	2	4	0	0
<30	1	0	0	0	0
TOTAL	187	187	187	187	187
		Percentage			
80+	0.0	0.5	1.1	16.0	27.8
70-79	3.2	43.3	50.8	55.6	54.0
60-69	24.1	26.2	20.9	16.6	18.2
50-59	21.9	16.0	12.3	10.2	0.0
40-49	22.5	12.8	12.8	1.6	0.0
30-39	27.8	1.1	2.1	0.0	0.0
<30	0.5	0.0	0.0	0.0	0.0
TOTAL	100.0	100.0	100.0	100.0	100.0

(table II.15). However, it is important to note that overall trends over such a long period may conceal some setbacks. While the number of countries with a life expectancy of 40 to 49 years remains unchanged from 1995-2000 to 2000-2005, two more countries are added to the list of those with life expectancies below 40 years. As a result, the percentage of the population residing in countries with a life expectancy below 50 years is expected to increase from 4.6 per cent in 1998 to 6.1 per cent in 2003.

D. MORTALITY IN CHILDHOOD

Over the past 50 years a major part of the reduction of mortality has occurred in childhood. Overall levels of life expectancy are strongly determined by mortality at young ages, especially when mortality is high. Consequently, the marked increases in life expectancy that occurred during 1950-2000 at the world level reflect in large part sharp drops of mortality in childhood. Thus, infant mortality at the world level decreased from 157 deaths per 1,000 live births in 1950-1955 to 60 deaths per 1,000 live births in 1995-2000, a reduction of 62 per cent (table II.16). During that period, the more developed regions registered the sharpest relative decline (86 per cent) whereas in the less developed regions the reduction was on the order of 64 per cent (from 180 deaths per 1,000 live births to 65 deaths per 1,000 live births). The least developed countries experienced the smallest reduction in relative terms (48 per cent) and infant mortality in that group of countries taken as whole remained above 100 deaths per 1,000 births in 1995-2000.

Future reductions of mortality are expected to result in the virtual elimination of deaths at young ages. However, certain regions and countries are expected to fare better than others in achieving such a goal. The world's infant mortality is projected to reach a level of 19.4 deaths per 1,000 live births in 2045-2050, being the result of 4.5 deaths per 1,000 live births in the more developed

TABLE II.15. DISTRIBUTION OF THE POPULATION BY LEVEL OF LIFE EXPECTANCY AT BIRTH, FOR SELECTED YEARS, 1950-2050

Level of life expectancy at birth (years)	*1953*	*1998*	*2003*	*2028*	*2048*
		Population of countries or areas (millions)			
80+	0	127	137	930	1 116
70-79	26	1 233	2 796	5 542	6 769
60-69	832	3 499	2 523	1 168	1 351
50-59	203	771	447	451	0
40-49	885	259	349	47	0
30-39	712	11	34	0	0
<30	0	0	0	0	0
TOTAL	2 658	5 898	6 286	8 137	9 236
		Percentage			
80+	0.0	2.1	2.2	11.4	12.1
70-79	1.0	20.9	44.5	68.1	73.3
60-69	31.3	59.3	40.1	14.3	14.6
50-59	7.6	13.1	7.1	5.5	0.0
40-49	33.3	4.4	5.6	0.6	0.0
30-39	26.8	0.2	0.5	0.0	0.0
<30	0.0	0.0	0.0	0.0	0.0
TOTAL	100.0	100.0	100.0	100.0	100.0

TABLE II.16. INFANT MORTALITY BY MAJOR AREA AND REGION, FOR SELECTED PERIODS, 1950-2050

Major area or region	*Infant mortality rate (infant deaths per 1,000 live births)*				
	1950-1955	*1995-2000*	*2000-2005*	*2025-2030*	*2045-2050*
World	157.2	59.6	54.5	31.0	19.4
More developed regions	59.1	8.3	7.8	5.4	4.5
Less developed regions	180.2	65.3	59.4	33.5	20.9
Least developed countries	196.7	101.6	92.2	50.5	28.8
Less developed regions without the least developed countries	177.9	55.7	49.6	26.5	17.4
Europe	72.4	9.8	9.4	6.2	4.9
Eastern Europe	91.3	15.1	15.0	9.1	6.6
Northern Europe	32.8	6.0	5.5	4.1	3.5
Southern Europe	76.1	8.4	7.5	5.6	4.8
Western Europe	45.4	5.2	4.7	4.0	3.6
Northern America	28.6	7.4	6.7	5.0	4.4
Oceania	60.3	26.1	24.3	13.8	8.4
Australia/New Zealand	24.2	5.6	5.4	4.4	3.7
Melanesia	144.7	57.9	52.0	26.9	16.3
Micronesia	119.3	21.5	18.8	10.8	8.1
Polynesia	116.7	19.5	16.9	9.5	7.0
Africa	181.1	91.2	83.0	45.6	26.2
Eastern Africa	180.7	103.1	94.4	51.4	28.4
Middle Africa	186.6	98.2	87.4	46.7	27.2
Northern Africa	188.1	57.7	49.0	22.1	13.5
Southern Africa	104.7	63.0	63.3	34.2	17.6
Western Africa	190.6	96.0	86.6	47.4	28.1
Asia	182.4	59.3	53.0	29.3	19.5
Eastern Asia	181.2	38.5	33.8	18.5	12.4
South-central Asia	187.9	76.1	68.6	39.7	26.9
South-eastern Asia	168.2	47.5	40.6	18.8	12.1
Western Asia	189.8	48.9	39.4	17.2	10.5
Latin America and the Caribbean	126.2	35.6	32.0	17.1	9.9
Caribbean	124.5	37.9	35.1	20.1	11.2
Central America	127.2	32.9	29.7	17.5	11.7
South America	126.1	36.7	32.7	16.6	9.0

regions and 20.9 deaths per 1,000 live births in the less developed regions. Attainment of such levels imply a 46 per cent reduction in infant mortality in the more developed regions and 68 per cent in the less developed regions between 1995-2000 and 2045-2050. In the least developed countries, infant mortality is projected to drop to 28.8 deaths per 1,000 births by 2045-2050, a 72 per cent reduction with respect to 1995-2000 levels. Thus, in contrast to past trends, it is expected that the least

developed countries will experience a sharper reduction of infant mortality than the less developed or the more developed regions. Such an outcome is possible because the speed of reductions decelerates as very low levels are reached.

Undoubtedly, the more developed regions have all reached very low levels of infant and under-five mortality, though the levels for Eastern Europe are somewhat higher and are expected to stagnate until 2000-2005 (tables II.16 and II.17).

TABLE II.17. MORTALITY UNDER AGE 5 BY MAJOR AREA AND REGION, FOR SELECTED PERIODS, 1995-2050

Major area or region	*Under-five mortality (deaths per 1,000 live births)*			
	1995-2000	*2000-2005*	*2025-2030*	*2045-2050*
World	86.4	78.9	42.9	24.9
More developed regions	10.3	9.7	6.8	5.6
Less developed regions	94.9	86.1	46.4	26.9
Least developed countries	166.5	150.4	76.8	39.7
Less developed regions without the least developed countries	75.8	67.0	33.8	21.3
Europe	12.1	11.7	7.9	6.3
Eastern Europe	18.7	18.6	11.8	8.6
Northern Europe	7.2	6.7	5.4	4.6
Southern Europe	10.4	9.3	6.9	5.9
Western Europe	6.4	5.9	5.1	4.5
Northern America	9.0	8.1	6.1	5.4
Oceania	35.4	32.5	17.1	10.2
Australia/New Zealand	7.0	6.7	5.6	4.7
Melanesia	79.9	70.7	33.4	19.2
Micronesia	27.1	23.3	12.8	9.4
Polynesia	24.2	20.9	11.5	8.4
Africa	151.6	138.3	71.0	37.1
Eastern Africa	176.1	161.4	81.8	41.0
Middle Africa	166.3	147.0	72.0	38.6
Northern Africa	78.5	65.4	27.2	15.2
Southern Africa	93.0	109.4	66.0	30.3
Western Africa	163.5	146.2	73.6	39.9
Asia	80.1	70.6	36.6	23.3
Eastern Asia	44.7	38.6	20.5	13.5
South-central Asia	107.2	94.8	51.3	32.8
South-eastern Asia	64.8	54.3	23.0	14.3
Western Asia	62.2	50.1	20.3	12.2
Latin America and the Caribbean	44.9	40.3	22.1	13.3
Caribbean	59.1	55.1	32.4	19.0
Central America	41.4	37.5	22.3	15.0
South America	45.0	40.1	21.1	12.1

Even if reductions in childhood mortality in the more developed regions are not expected to be large in the future, those regions will still have the lowest mortality levels in childhood by 2045-2050. The regions of Latin America and the Caribbean, as well as Eastern Asia, Micronesia and Polynesia, had all attained relatively low levels of childhood mortality by 1995-2000, with infant mortality ranging from 19.5 to 38.5 deaths per 1,000 and mortality under age five ranging from 20.9 to 55.1 deaths per 1,000. Infant mortality in those regions is expected to drop to about a quarter or a third of current levels by 2045-2050 and reductions in under-five mortality are projected to amount to at least half of current levels. Among other regions, Melanesia, Northern Africa, South-Eastern Asia and Western Asia had moderate levels of infant and under-five mortality in 1995-2000, with under-five mortality ranging from 50.1 to 70.7 deaths per 1,000. By 2045-2050 their mortality levels in childhood are expected to be considerably lower, with under-five mortality ranging from 12.2 to 19.2 deaths per 1,000. The rest of the regions, including those of sub-Saharan Africa and South-Central Asia, were each characterized by very high levels of mortality in childhood in 1995-2000, with under-five mortality ranging from 95 to 161 deaths per 1,000. Although those regions are also expected to experience significant reductions of child mortality, by 2045-2050 they will still be experiencing some of the highest levels of infant and under-five mortality in the world, with under-five mortality ranging from 30.3 to 41 deaths per 1,000. By 2045-2050, 11 of the 15 regions in the developing world are expected to have infant mortality levels below 20 deaths per 1,000 and ten will have under-five mortality levels below 30 deaths per 1,000 births. Largely because of the effects of HIV/AIDS, only the regions of sub-Saharan Africa and South-central Asia are projected to have relatively high infant mortality and under-five mortality levels by the end of the projection period. In fact, Southern Africa, the region most affected by HIV/AIDS, is expected to register an increase in infant and under-five mortality between 1995-2000 and 2000-2005.

In terms of specific countries, tables II.18 and II.19 show the 20 countries with the highest and the 20 countries with the lowest levels of infant and under-five mortality respectively for selected periods. In 1995-2000, levels of infant and under-five mortality varied considerably among the countries and areas of the world, with the highest level of infant mortality being 47 times as large as the lowest level (165 deaths per 1,000 versus 3.5 deaths per thousand). Although the range of variation is expected to narrow considerably by 2045-2050, the highest level of infant mortality will still be 34 times higher than the lowest level (84 deaths per 1,000 versus 2.5 deaths per 1,000). The situation is similar when under-five mortality is considered: in 1995-2000 the highest level is 65 times larger than the lowest one, whereas in 2045-2050 the ratio between the two is 36. Most of the countries experiencing the highest mortality in childhood belong to the group of least developed countries, are located in sub-Saharan Africa and are highly affected by the HIV/AIDS epidemic. On the whole, expected trends in infant and under-five mortality corroborate those reflected by life expectancy at birth. Despite the major achievements in reducing mortality at the world level, a significant number of countries are still experiencing high mortality. Clearly, if the projected reductions of mortality over the long run are to become a reality, efforts to combat the causes of death in early life are of particular importance.

E. From deaths to death rates

The very rapid and sustained reduction of mortality that has occurred at the world level since 1950 gave way to a declining number of deaths until 1970-1975, even though the population was growing rapidly. As table II.20 shows, since 1970-1975 the number of deaths in the world has been rising moderately so that slightly more deaths occurred in 1995-2000 than in 1950-1955 (265 million versus 260 million). However, because of the increasing population of the world, the crude death rate in 1995-2000 was less than half of what it had been in 1950-1955 (9 deaths per 1,000 persons versus 19.7 deaths per 1,000 persons). Furthermore, by 1995-2000, there was only a small difference between the death rate in more developed regions and that in less developed regions, and the direction of the differential had changed with respect to earlier periods. That is, whereas until 1980-1985 the death rate in less developed regions had been higher than that of more devel-

TABLE II.18. TWENTY COUNTRIES OR AREAS WITH THE HIGHEST AND TWENTY COUNTRIES OR AREAS WITH THE LOWEST INFANT MORTALITY, FOR SELECTED PERIODS, 1995-2050

(Deaths per 1,000 live births)

Country or area	*1995-2000*	*Country or area*	*2000-2005*	*Country or area*	*2025-2030*	*Country or area*	*2045-2050*
Sierra Leone	165.4	Afghanistan	161.3	Afghanistan	118.0	Afghanistan	83.9
Afghanistan	164.7	Sierra Leone	146.3	Sierra Leone	94.5	Sierra Leone	53.9
Malawi	139.8	Malawi	130.1	Niger	79.6	Niger	45.9
Mozambique	136.7	Mozambique	127.7	Mozambique	74.7	Angola	43.4
Niger	136.1	Niger	125.7	Guinea-Bissau	74.1	Gambia	41.8
East Timor	135.0	Guinea-Bissau	121.2	Angola	74.1	Mali	41.7
Guinea-Bissau	130.8	East Timor	120.9	Gambia	71.4	Mozambique	39.7
Mali	130.3	Mali	120.5	Malawi	70.4	Guinea-Bissau	39.2
Angola	126.2	Rwanda	119.2	Guinea	69.4	Guinea	37.1
Gambia	125.3	Angola	117.7	Mali	68.6	Malawi	36.6
Guinea	124.2	Djibouti	117.1	Somalia	67.9	Somalia	36.4
Chad	122.5	Chad	116.1	Djibouti	66.8	Pakistan	36.2
Somalia	122.3	Gambia	115.0	Rwanda	65.5	Rwanda	35.4
Rwanda	121.9	Guinea	114.4	Burundi	64.9	Lesotho	34.6
Burundi	120.0	Somalia	112.7	Chad	63.0	Burundi	33.7
Djibouti	116.6	Burundi	111.5	Lesotho	60.8	Chad	33.1
Ethiopia	114.8	Lesotho	111.2	East Timor	59.1	Djibouti	33.0
Liberia	111.4	Ethiopia	106.1	Equatorial Guinea	56.3	Myanmar	31.0
Lesotho	108.1	Equatorial Guinea	98.8	Ethiopia	53.0	Equatorial Guinea	30.1
Equatorial Guinea	107.7	Mauritania	96.7	Madagascar	51.3	Uganda	28.3
Country or area	*1995-2000*	*Country or area*	*2000-2005*	*Country or area*	*2025-2030*	*Country or area*	*2045-2050*
United Kingdom	5.9	United Kingdom	5.4	Spain	4.6	Switzerland	3.8
Czech Republic	5.8	Italy	5.4	Australia	4.3	Slovenia	3.8
Channel Islands	5.8	Canada	5.4	Switzerland	4.2	Netherlands	3.7
Spain	5.7	Czech Republic	5.4	France	4.2	Czech Republic	3.7
Italy	5.6	Spain	5.3	Slovenia	4.1	Singapore	3.7
Canada	5.5	Australia	5.2	Luxembourg	4.1	Cuba	3.6
France	5.5	Denmark	5.0	Denmark	4.1	France	3.6
Austria	5.4	France	5.0	Netherlands	4.1	Australia	3.6
Australia	5.4	Switzerland	4.8	Czech Republic	4.0	Denmark	3.6
Switzerland	5.1	Austria	4.7	United Kingdom	4.0	Austria	3.5
Germany	5.0	Singapore	4.6	Singapore	4.0	Luxembourg	3.5
Singapore	4.9	Germany	4.6	Austria	4.0	Germany	3.5
Norway	4.8	Iceland	4.5	Germany	3.9	United Kingdom	3.4
Iceland	4.7	Norway	4.5	Iceland	3.8	Belgium	3.3
Netherlands	4.6	Netherlands	4.5	Belgium	3.7	Iceland	3.3
Belgium	4.4	Belgium	4.2	Norway	3.6	China, Hong Kong SAR	3.2
Finland	4.4	China, Hong Kong SAR	4.1	China, Hong Kong SAR	3.6	Norway	3.0
China, Hong Kong SAR	4.2	Finland	4.0	Finland	3.3	Finland	2.9
Sweden	3.5	Sweden	3.4	Sweden	2.9	Japan	2.5
Japan	3.5	Japan	3.3	Japan	2.9	Sweden	2.5

TABLE II.19. TWENTY COUNTRIES OR AREAS WITH THE HIGHEST AND TWENTY COUNTRIES OR AREAS WITH THE LOWEST MORTALITY UNDER AGE 5, FOR SELECTED PERIODS, 1995-2050

(Deaths per 1,000 live births)

Country or area	*1995-2000*	*Country or area*	*2000-2005*	*Country or area*	*2025-2030*	*Country or area*	*2045-2050*
Sierra Leone	287.2	Afghanistan	279.2	Afghanistan	185.5	Afghanistan	114.6
Afghanistan	286.7	Sierra Leone	254.3	Sierra Leone	156.7	Sierra Leone	83.5
Mali	260.7	Mali	235.6	Niger	125.8	Niger	66.5
Malawi	238.4	Mozambique	224.2	Mozambique	124.1	Angola	64.8
Mozambique	234.8	Malawi	223.8	Angola	120.1	Gambia	61.7
Niger	227.8	Niger	209.9	Guinea-Bissau	119.2	Mozambique	60.5
Guinea-Bissau	225.3	Guinea-Bissau	207.8	Malawi	115.8	Mali	60.4
Rwanda	220.4	Djibouti	202.3	Mali	115.3	Guinea-Bissau	57.1
Angola	218.2	Angola	201.4	Djibouti	115.2	Malawi	54.2
Gambia	214.5	Chad	198.3	Gambia	114.1	Guinea	51.3
Chad	212.1	Burundi	197.9	Burundi	108.6	Rwanda	50.9
Burundi	211.5	Rwanda	196.0	Guinea	107.8	Djibouti	50.2
Guinea	207.4	Gambia	195.5	Somalia	104.9	Burundi	50.0
Somalia	203.9	Guinea	189.5	Chad	99.3	Somalia	49.9
East Timor	200.9	Somalia	186.0	Lesotho	98.3	Lesotho	49.3
Djibouti	198.8	Ethiopia	182.9	Rwanda	97.6	Chad	46.4
Ethiopia	197.4	Lesotho	181.1	Ethiopia	86.5	Pakistan	46.2
Uganda	186.0	East Timor	177.9	Equatorial Guinea	84.7	Swaziland	41.8
Equatorial Guinea	176.7	Swaziland	170.9	East Timor	79.7	Ethiopia	40.8
Mauritania	172.7	Equatorial Guinea	160.2	Uganda	77.7	Myanmar	40.7
Country or area	*1995-2000*	*Country or area*	*2000-2005*	*Country or area*	*2025-2030*	*Country or area*	*2045-2050*
Czech Republic	7.3	Spain	6.7	Channel Islands	5.6	Slovenia	5.0
Spain	7.1	Italy	6.6	Netherlands	5.5	Malta	5.0
United Kingdom	6.9	Canada	6.6	Slovenia	5.5	Czech Republic	4.9
Italy	6.8	Channel Islands	6.5	Denmark	5.5	Denmark	4.9
Channel Islands	6.8	United Kingdom	6.5	Australia	5.4	Cuba	4.9
France	6.8	Australia	6.5	Luxembourg	5.3	Switzerland	4.8
Canada	6.7	Denmark	6.5	Czech Republic	5.3	Singapore	4.7
Australia	6.7	Netherlands	6.2	Switzerland	5.2	Australia	4.6
Austria	6.5	France	6.1	France	5.2	Luxembourg	4.6
Netherlands	6.4	Belgium	5.9	Singapore	5.2	France	4.5
Belgium	6.4	Norway	5.9	United Kingdom	5.1	Belgium	4.5
Switzerland	6.2	Iceland	5.9	Belgium	5.1	Germany	4.4
Norway	6.2	Switzerland	5.9	Iceland	5.0	Austria	4.4
Singapore	6.1	Singapore	5.8	Austria	4.9	United Kingdom	4.4
Iceland	6.0	Austria	5.6	Germany	4.9	Iceland	4.4
Germany	6.0	Germany	5.6	Norway	4.9	China, Hong Kong SAR	4.1
China, Hong Kong SAR	5.3	China, Hong Kong SAR	5.2	China, Hong Kong SAR	4.6	Norway	4.0
Finland	5.1	Finland	4.8	Finland	4.4	Finland	4.0
Japan	4.9	Japan	4.6	Sweden	3.9	Sweden	3.3
Sweden	4.4	Sweden	4.3	Japan	3.8	Japan	3.2

TABLE II.20. NUMBER OF DEATHS PER QUINQUENNIUM AND CRUDE DEATH RATE BY MAJOR AREA AND REGION, 1950-2000

Major area or region	*1950-1955*	*1955-1960*	*1960-1965*	*1965-1970*	*1970-1975*	*1975-1980*	*1980-1985*	*1985-1990*	*1990-1995*	*1995-2000*
					Number of deaths (millions)					
World	260	251	248	235	225	231	238	242	257	265
More developed regions	43	43	44	46	49	50	53	54	58	60
Less developed regions	216	208	204	189	176	181	185	188	198	205
Least developed countries	30	30	32	33	34	36	37	39	43	46
Less developed regions without the least developed countries	187	177	172	156	142	145	148	149	155	159
Europe	30	30	30	31	34	36	37	38	41	42
Northern America	8	9	10	11	11	11	11	12	13	13
Oceania	1	1	1	1	1	1	1	1	1	1
Africa	31	32	34	35	36	38	40	42	47	53
Asia	175	165	159	142	128	131	133	134	139	141
Latin America and the Caribbean	14	14	15	15	15	15	15	15	15	16
					Crude death rate (per 1,000)					
World	19.7	17.4	15.6	13.4	11.6	10.9	10.3	9.6	9.4	9.0
More developed regions	10.3	9.7	9.4	9.3	9.5	9.5	9.6	9.6	10.1	10.2
Less developed regions	24.1	20.8	18.3	15.0	12.4	11.4	10.5	9.6	9.2	8.8
Least developed countries	28.7	26.5	24.6	22.4	20.9	19.7	17.7	16.3	15.8	14.9
Less developed regions without the least developed countries	23.5	20.1	17.4	14.0	11.3	10.3	9.5	8.7	8.3	7.8
Europe	10.8	10.0	9.7	9.7	10.1	10.4	10.7	10.6	11.2	11.5
Northern America	9.4	9.3	9.3	9.3	9.0	8.5	8.5	8.6	8.8	8.4
Oceania	12.4	11.3	10.6	10.3	9.7	8.8	8.3	8.2	7.7	7.5
Africa	26.8	24.6	22.8	20.9	19.1	17.5	16.0	14.6	14.3	14.1
Asia	23.8	20.4	17.7	14.1	11.3	10.4	9.7	8.9	8.5	7.9
Latin America and the Caribbean	15.6	13.8	12.4	11.1	9.9	8.8	7.9	7.2	6.7	6.5

oped regions, by 1985-1990 both were the same. Since then, the ageing populations of the more developed regions have experienced higher crude death rates than the younger ones of the less developed regions, despite the fact that mortality levels, as measured by the expectation of life at birth, have been considerably lower in more developed regions. As a result of such changes, by 1995-2000, the more developed regions accounted for 22.7 per cent of all deaths in the world whereas in 1950-1955 their share of all deaths was 16.7 per cent.

With regard to future prospects table II.21 shows that crude death rates at the world level will continue to decline until 2020-2025 in the medium and high variants and until 2015-2020 in the low variant. An increasing trend will be evident toward the second half of the projection period, although its starting point and magnitude differ from one variant to another. The increasing crude death rates at the world level will result from population ageing. This process has already caused an increase in the crude death rates in more developed regions and will continue to do so in the future. Less developed regions, whose populations still have a relatively young age structure, will start experiencing increasing death rates only after 2025 in the medium variant and one period earlier or later, respectively, in the low and high variants. Over the whole projection period, crude death rates of the less developed regions will be considerably lower than the ones projected for the more developed regions.

As illustrated in table II.22, all projection variants produce an increasing number of deaths at the world level, so that by 2045-2050 the number of deaths of the world population is projected to vary from a high of 459 million according to the high variant and a low of 438 million according to the low variant. Of these deaths, about 18 per cent will occur in the more developed regions, representing a reduction in the share of those regions from the peak of about 22.8 per cent reached in 1990-1995.

In terms of major areas, crude death rates in Europe fluctuated within a narrow range during 1950-2000 and showed an increasing trend since about 1990 (table II.20). Those of Northern America tended to remain stagnant for long periods but with a tendency to decrease. In contrast, the crude death rates of Africa, Asia, Latin America and the Caribbean, and Oceania fell markedly, though in 1995-2000 Africa's death rate was still moderately high (at 14.1 deaths per 1,000 persons). Before the end of the projection period, the death rates for all major areas, with the possible exception of Africa, will begin to increase as a consequence of population ageing. The starting point for this trend will vary among major areas. Europe, for instance, displays increasing death rates prior to the beginning of the projection period, whereas for most other major areas death rates increase only towards the middle of the projection period (table II.21). As a result of the changing population structure, the number of deaths continues to increase in almost every major area according to all projection variants; the only exception being the number of deaths in Africa according to the low variant (table II.22). Over the whole projection period, the majority of deaths in the world occurs in Asia, followed by Africa and then by Europe. In 2000-2005, Asia is expected to account for 52 per cent of all deaths, Africa for 21 per cent and Europe for 15 per cent. Over time, the share of Asia is expected to increase and those of Africa and Europe are expected to fall. By 2045-2050, 60 per cent of all deaths will likely occur in Asia, 15 per cent in Africa and 11 per cent in Europe. These percentages vary little from one variant to another.

It is of interest to compare the number of deaths projected by assuming a continued reduction of mortality in most countries with the number that would be expected if mortality ceased to change, that is, if it remained constant in each country at the level attained in 1995-2000. Table II.23 shows the resulting life expectancies at birth for the world and its major areas derived by assuming constant mortality at the country level. Because of differential growth rates among countries and the resulting changes in population distribution over time, constant mortality at the country level does not imply constant mortality at other levels of aggregation. Thus, some change in life expectancy over time is expected for the world and its major areas. However, as table II.23 indicates, according to the constant-mortality scenario, variations in the life expectancy of the world and major areas

TABLE II.21. PROJECTED CRUDE DEATH RATE BY MAJOR AREA AND REGION: LOW, MEDIUM AND HIGH VARIANTS, 2000-2050

Major area or region	*Crude death rate (per 1,000)*									
	2000-2005	*2005-2010*	*2010-2015*	*2015-2020*	*2020-2025*	*2025-2030*	*2030-2035*	*2035-2040*	*2040-2045*	*2045-2050*
					Low variant					
World	8.8	8.6	8.5	8.5	8.6	8.9	9.3	9.9	10.5	11.1
More developed regions	10.4	10.5	10.7	11.0	11.4	12.0	12.7	13.5	14.3	14.9
Less developed regions	8.4	8.2	8.0	8.0	8.1	8.4	8.7	9.2	9.9	10.5
Least developed countries	13.9	12.6	11.3	10.2	9.3	8.5	8.0	7.6	7.4	7.4
Less developed regions without the least developed countries	7.6	7.4	7.4	7.6	7.9	8.3	8.9	9.6	10.5	11.4
Europe	11.8	11.9	12.1	12.4	12.9	13.4	14.2	15.1	16.0	16.9
Northern America	8.3	8.3	8.4	8.5	8.9	9.5	10.3	11.1	11.7	12.1
Oceania	7.6	7.6	7.8	7.9	8.2	8.5	9.1	9.6	10.1	10.6
Africa	13.7	13.0	11.9	10.8	9.9	9.1	8.5	8.1	7.9	7.8
Asia	7.5	7.4	7.4	7.5	7.8	8.3	9.0	9.7	10.6	11.5
Latin America and the Caribbean	6.4	6.4	6.5	6.8	7.2	7.7	8.4	9.2	10.1	11.0
					Medium variant					
World	8.9	8.7	8.5	8.4	8.4	8.5	8.7	9.0	9.4	9.7
More developed regions	10.4	10.5	10.7	10.9	11.2	11.7	12.2	12.9	13.4	13.7
Less developed regions	8.5	8.3	8.0	7.9	7.8	7.9	8.2	8.4	8.8	9.1
Least developed countries	14.1	12.8	11.4	10.2	9.2	8.3	7.7	7.2	6.9	6.8
Less developed regions without the least developed countries	7.6	7.5	7.4	7.4	7.6	7.9	8.3	8.7	9.3	9.8
Europe	11.8	11.9	12.1	12.3	12.7	13.1	13.7	14.5	15.1	15.7
Northern America	8.3	8.3	8.3	8.3	8.6	9.1	9.7	10.3	10.7	10.9
Oceania	7.6	7.6	7.7	7.8	8.0	8.3	8.7	9.1	9.4	9.7
Africa	13.9	13.1	11.9	10.7	9.7	8.8	8.2	7.7	7.4	7.2
Asia	7.6	7.4	7.3	7.4	7.6	7.9	8.3	8.8	9.4	9.9
Latin America and the Caribbean	6.5	6.4	6.4	6.6	6.8	7.2	7.7	8.2	8.8	9.3

TABLE II.21 (*continued*)

Major area or region	*Crude death rate (per 1,000)*									
	2000-2005	*2005-2010*	*2010-2015*	*2015-2020*	*2020-2025*	*2025-2030*	*2030-2035*	*2035-2040*	*2040-2045*	*2045-2050*
					High variant					
World	8.9	8.7	8.4	8.2	8.1	8.2	8.2	8.4	8.5	8.6
More developed regions	10.4	10.4	10.5	10.7	10.9	11.3	11.7	12.1	12.4	12.5
Less developed regions	8.6	8.3	8.0	7.8	7.6	7.6	7.7	7.8	7.9	8.1
Least developed countries	14.2	12.9	11.5	10.2	9.1	8.2	7.5	6.9	6.5	6.2
Less developed regions without the least developed countries	7.7	7.5	7.4	7.3	7.3	7.5	7.7	8.0	8.3	8.6
Europe	11.8	11.9	12.0	12.2	12.5	12.8	13.3	13.9	14.3	14.6
Northern America	8.3	8.2	8.1	8.1	8.2	8.6	9.1	9.5	9.7	9.7
Oceania	7.6	7.6	7.7	7.7	7.8	8.0	8.3	8.6	8.7	8.8
Africa	14.0	13.2	11.9	10.7	9.6	8.7	7.9	7.4	6.9	6.6
Asia	7.7	7.4	7.3	7.3	7.3	7.5	7.8	8.1	8.4	8.7
Latin America and the Caribbean	6.5	6.4	6.4	6.4	6.5	6.8	7.1	7.4	7.7	8.0

TABLE II.22. PROJECTED NUMBER OF DEATHS PER QUINQUENNIUM BY MAJOR AREA AND REGION: LOW, MEDIUM AND HIGH VARIANTS, 2000-2050

Major area or region	*2000-2005*	*2005-2010*	*2010-2015*	*2015-2020*	*2020-2025*	*2025-2030*	*2030-2035*	*2035-2040*	*2040-2045*	*2045-2050*
	Number of deaths (millions)									
					Low variant					
World	275	282	291	303	318	337	360	385	413	438
More developed regions	62	63	64	66	68	71	74	77	80	81
Less developed regions	212	219	227	237	250	266	286	308	333	356
Least developed countries	49	49	49	49	49	49	50	51	53	56
Less developed regions without the least developed countries	164	170	178	188	200	217	236	257	279	300
Europe	43	43	43	43	44	44	45	47	48	48
Northern America	13	14	14	15	16	18	20	21	23	24
Oceania	1	1	1	1	2	2	2	2	2	2
Africa	58	60	61	61	61	60	60	61	63	65
Asia	143	146	153	162	173	188	205	224	244	263
Latin America and the Caribbean	17	18	19	21	23	25	28	31	34	36
					Medium variant					
World	277	287	297	309	324	345	368	394	422	448
More developed regions	62	63	65	66	68	71	74	78	80	81
Less developed regions	215	224	233	243	256	274	294	317	342	367
Least developed countries	49	51	51	51	52	52	53	55	57	60
Less developed regions without the least developed countries	166	173	182	192	205	222	241	262	285	307
Europe	43	43	43	43	44	44	46	47	48	48
Northern America	13	14	14	15	16	18	20	21	23	24
Oceania	1	1	1	1	2	2	2	2	2	2
Africa	59	62	63	63	63	63	64	65	67	69
Asia	144	149	156	166	177	192	209	228	248	268
Latin America and the Caribbean	17	18	20	21	23	26	28	31	34	37

TABLE II.22 (*continued*)

Major area or region	*Number of deaths (millions)*									
	2000-2005	*2005-2010*	*2010-2015*	*2015-2020*	*2020-2025*	*2025-2030*	*2030-2035*	*2035-2040*	*2040-2045*	*2045-2050*
					High variant					
World	280	291	302	315	331	352	377	404	433	459
More developed regions	62	63	65	66	68	71	74	78	80	82
Less developed regions	217	228	238	249	263	281	302	326	352	378
Least developed countries	50	52	53	53	54	55	56	58	60	64
Less developed regions without the least developed countries	167	176	185	196	209	226	246	268	292	314
Europe	43	43	43	43	44	45	46	47	48	48
Northern America	13	14	14	15	16	18	20	21	23	24
Oceania	1	1	1	1	2	2	2	2	2	2
Africa	59	63	64	65	65	66	67	68	71	74
Asia	146	152	159	169	181	196	214	233	254	273
Latin America and the Caribbean	18	19	20	22	24	26	29	32	35	38

TABLE II.23. LIFE EXPECTANCY AT BIRTH FOR THE WORLD AND ITS MAJOR AREAS, CONSTANT-MORTALITY SCENARIO AND MEDIUM VARIANT, SELECTED PERIODS, 2000-2050

Major area or region	Life expectancy at birth (years)						Relative difference (percentage)		
	Constant-mortality scenario			Medium variant					
	2000-2005	2025-2030	2045-2050	2000-2005	2025-2030	2045-2050	2000-2005	2025-2030	2045-2050
World	64.6	63.0	62.4	66.0	72.4	76.0	-2.1	-12.9	-17.9
More developed regions	74.9	75.1	75.3	75.6	80.0	82.1	-0.9	-6.1	-8.3
Less developed regions	62.6	61.3	60.8	64.1	70.9	75.0	-2.3	-13.6	-19.0
Least developed countries	50.2	49.6	49.4	51.4	62.8	69.7	-2.3	-21.0	-29.0
Less developed regions without the least developed countries	65.3	64.9	64.8	66.8	73.1	76.6	-2.1	-11.2	-15.4
Europe	73.2	73.4	73.6	73.7	78.4	80.8	-0.7	-6.3	-8.9
Northern America	76.7	76.6	76.6	77.7	81.1	82.7	-1.2	-5.5	-7.3
Oceania	73.3	72.3	71.8	74.4	78.4	80.6	-1.5	-7.7	-10.8
Africa	51.2	50.3	50.0	51.3	62.0	69.5	-0.2	-18.8	-28.1
Asia	65.6	65.1	64.8	67.4	73.9	77.1	-2.7	-12.0	-16.0
Latin America and the Caribbean	69.3	69.2	69.2	70.4	75.0	77.8	-1.6	-7.8	-11.0

over the 2000-2050 period are small, amounting at most to 2 years of life expectancy. The largest deviations from a constant mortality level are found in the less developed regions and they are caused by the rapid growth of high mortality countries, especially those in Africa and in Oceania.

When the projected expectation of life in 2045-2050 according to the medium variant is compared with that produced by the constant-mortality scenario, differences ranging from 7 per cent to 11 per cent are found for Europe, Latin America and the Caribbean, Northern America and Oceania, whereas for Asia the medium variant projects a life expectancy that is 16 per cent higher than that produced by the constant-mortality scenario and for Africa the medium variant's life expectancy in 2045-2050 is 28 per cent higher than that of the constant-mortality scenario. Such differences in life expectancy coupled with the differences in age distribution resulting from the permanence of relatively high mortality in the constant-mortality scenario result in markedly higher numbers of deaths in relation to the number expected according to the medium variant. At the world level, if mortality were to remain constant from 1995 to 2050, nearly 34 per cent more deaths would be expected in 2045-2050 than under the declining mortality assumptions underlying the medium variant, a difference of 152 million deaths (table II.24). The large majority of the excess deaths produced by constant mortality would occur in the less developed regions (143 million) and particularly in the least developed countries (50 million). Africa and Asia would account for most of the excess deaths in the constant-mortality scenario, with 55 million and 79 million additional deaths, respectively, in 2045-2050 than projected by the medium variant. In sharp contrast, the number of excess deaths associated with constant mortality in Europe, Latin America and the Caribbean, Northern America and Oceania would be very low, amounting to 17 million in total. These results underscore the importance of ensuring that mortality decline in the least developed countries of the world maintains or regains momentum so as to ensure that the future is indeed closer to the results of the medium variant than to those suggested by the constant-mortality scenario.

Another aspect of mortality trends that needs consideration is the changing age distribution of deaths. Table II.25 shows the number of deaths by broad age group for selected past and future peri-

TABLE II.24. NUMBER OF DEATHS FOR THE WORLD AND ITS MAJOR AREAS, CONSTANT-MORTALITY SCENARIO AND MEDIUM VARIANT, SELECTED PERIODS, 2000-2050

Major area or region	Number of deaths (millions)						Difference (millions)			Relative difference (percentage)		
	Constant-mortality scenario			Medium variant								
	2000-2005	2025-2030	2045-2050	2000-2005	2025-2030	2045-2050	2000-2005	2025-2030	2045-2050	2000-2005	2025-2030	2045-2050
World	295	462	599	277	345	448	17	118	152	6.3	34.1	33.8
More developed regions	65	83	90	62	71	81	3	12	9	4.2	17.0	10.5
Less developed regions	230	379	510	215	274	367	15	106	143	6.9	38.6	39.0
Least developed countries	52	85	110	49	52	60	3	33	50	5.7	63.2	83.3
Less developed regions without the least developed countries	178	294	400	166	222	307	12	73	93	7.3	32.8	30.4
Europe	44	52	53	43	44	48	1	7	5	3.3	16.1	10.5
Northern America	14	21	26	13	18	24	1	3	3	5.5	18.4	11.2
Oceania	1	2	3	1	2	2	0	0	0	5.5	22.3	21.7
Africa	60	97	125	59	63	69	1	34	55	1.7	53.6	79.8
Asia	157	259	347	144	192	268	13	66	79	9.1	34.6	29.6
Latin America and the Caribbean	18	32	46	17	26	37	1	7	9	6.3	25.9	24.0

ods. At the world level, the mortality reduction experienced since 1950, coupled with the sharp decline in fertility that has been observed since 1975, have resulted in major changes in the distribution of deaths by age. Thus, in contrast to the period 1950-1955, when 42 per cent of all deaths took place before the age of five and just 26 per cent occurred above age 60, by 1995-2000 21 per cent of all deaths took place by age five and 50 per cent occurred among persons aged 60 years or over. By the end of the projection period, it is expected that only 4 per cent of all deaths will occur before the age of five, and that 81 per cent of all deaths will be those of persons aged 60 years or over.

In the more developed regions the shift of mortality to older ages could be observed much earlier than in the less developed regions. As a result, by 1995-2000 just one per cent of all deaths in the more developed regions took place before age five, and 80 per cent of all deaths occurred at age 60 or later in life. By 2045-2050, merely 0.5 per cent of all deaths will take place before age 20 while a striking 94 per cent of all deaths will occur at age 60 or thereafter. Also noteworthy is that 64 per cent of all deaths will take place at age 80 or over.

In the less developed regions the transformation of the age distribution of deaths has paralleled that of the world as a whole, with deaths under age five accounting for 49 per cent in 1950-1955, 27 per cent in 1995-2000 and 4 per cent in 2045-2050. The share of deaths among the elderly (60 or over) followed an increasing trend, rising from 19 per cent in 1950-1955 to 41 per cent in 1995-2000, and is expected to reach 78 per cent in 2045-2050. At that time, deaths among the elderly will be almost equally distributed among age groups 60-79 and 80 or over. In the least developed countries, characterized by higher mortality and higher fertility, the age distribution of mortality will remain rather "young" well into the twenty-first century. Even by 2025-2030, 26 per cent of all deaths in the least developed countries are expected to take place before age five, a figure that will likely be about 12 per cent by 2045-2050. Concomitantly, a less marked concentration of deaths will occur at older ages. By 2025-2030, only a third of all deaths will occur at age 60 or over, and that proportion will rise just to 52 per cent by 2045-2050.

In terms of major areas, Europe and Northern America will continue to show a clear concentration of deaths at ages 60 or over, with 90 per cent

TABLE II.25. AGE DISTRIBUTION OF DEATHS BY MAJOR AREA AND REGION, FOR SELECTED PERIODS, 1950-2050 (MEDIUM VARIANT)

Major area or region	Period	Number of deaths (millions)							Percentage of deaths					
		Total	0-4	5-19	20-39	40-59	60-79	80+	0-4	5-19	20-39	40-59	60-79	80+
World	1950-1955	259.7	110.2	18.3	27.1	36.7	53.8	13.6	42	7	10	14	21	5
	1995-2000	265.1	56.8	12.3	25.6	38.6	87.1	44.7	21	5	10	15	33	17
	2025-2030	344.7	29.1	6.8	25.1	46.3	140.3	97.2	8	2	7	13	41	28
	2045-2050	447.9	16.7	4.0	19.6	43.5	176.3	187.8	4	1	4	10	39	42
More developed regions	1950-1955	43.3	4.5	1.2	3.5	8.5	18.0	7.6	10	3	8	20	42	17
	1995-2000	60.3	0.7	0.5	2.6	8.4	26.0	22.1	1	1	4	14	43	37
	2025-2030	71.1	0.4	0.1	1.0	5.7	29.0	34.9	1	0	1	8	41	49
	2045-2050	81.4	0.3	0.1	0.6	3.9	25.5	51.0	0	0	1	5	31	63
Less developed regions	1950-1955	216.4	105.7	17.1	23.6	28.2	35.8	6.1	49	8	11	13	17	3
	1995-2000	204.8	56.1	11.9	23.0	30.1	61.1	22.6	27	6	11	15	30	11
	2025-2030	273.6	28.6	6.6	24.2	40.6	111.3	62.3	10	2	9	15	41	23
	2045-2050	366.6	16.3	3.9	19.1	39.6	150.8	136.8	4	1	5	11	41	37
Least developed countries	1950-1955	29.8	15.8	3.0	3.4	3.3	3.6	0.7	53	10	11	11	12	2
	1995-2000	46.2	20.5	4.3	7.4	5.6	6.6	1.8	44	9	16	12	14	4
	2025-2030	52.1	13.8	3.5	9.4	8.4	12.0	5.0	26	7	18	16	23	10
	2045-2050	59.8	7.3	2.1	9.1	10.4	20.0	10.8	12	4	15	17	33	18
Less developed regions without the least developed countries	1950-1955	186.6	89.9	14.1	20.2	24.9	32.2	5.4	48	8	11	13	17	3
	1995-2000	158.7	35.6	7.6	15.6	24.5	54.6	20.7	22	5	10	15	34	13
	2025-2030	221.5	14.8	3.1	14.7	32.3	99.3	57.3	7	1	7	15	45	26
	2045-2050	306.8	9.0	1.8	10.0	29.2	130.8	126.0	3	1	3	10	43	41
Europe	1950-1955	30.3	2.9	0.8	2.4	6.1	12.7	5.4	9	3	8	20	42	18
	1995-2000	41.8	0.5	0.3	1.9	6.1	18.4	14.6	1	1	4	15	44	35
	2025-2030	44.5	0.2	0.1	0.6	4.0	18.9	20.7	1	0	1	9	43	46
	2045-2050	48.1	0.2	0.0	0.3	2.4	16.5	28.7	0	0	1	5	34	60
Northern America	1950-1955	8.4	0.8	0.2	0.6	1.6	3.7	1.6	9	2	8	18	44	19
	1995-2000	12.9	0.2	0.1	0.6	1.6	5.2	5.1	2	1	4	13	41	40
	2025-2030	17.8	0.2	0.1	0.3	1.3	7.6	8.4	1	0	2	7	43	47
	2045-2050	23.6	0.1	0.0	0.2	1.2	6.8	15.1	1	0	1	5	29	64

TABLE II.25 (*continued*)

Major area or region	*Period*	*Number of deaths (millions)*							*Percentage of deaths*					
		Total	*0-4*	*5-19*	*20-39*	*40-59*	*60-79*	*80+*	*0-4*	*5-19*	*20-39*	*40-59*	*60-79*	*80+*
Oceania	1950-1955	0.8	0.2	0.0	0.1	0.1	0.3	0.1	21	5	12	16	32	14
	1995-2000	1.1	0.1	0.0	0.1	0.1	0.4	0.4	9	2	7	13	37	32
	2025-2030	1.7	0.1	0.0	0.0	0.2	0.7	0.7	3	1	3	10	41	42
	2045-2050	2.2	0.0	0.0	0.0	0.2	0.8	1.2	1	0	1	7	35	55
Africa	1950-1955	31.3	16.4	3.3	3.5	3.4	3.9	0.7	52	11	11	11	13	2
	1995-2000	52.6	21.6	4.8	9.6	6.7	7.7	2.3	41	9	18	13	15	4
	2025-2030	62.9	13.8	3.8	15.0	10.6	13.5	6.3	22	6	24	17	21	10
	2045-2050	69.3	7.2	2.3	12.8	12.4	21.5	13.2	10	3	18	18	31	19
Asia	1950-1955	174.9	83.1	13.0	19.0	23.8	30.9	5.1	48	7	11	14	18	3
	1995-2000	140.5	31.9	6.4	11.6	21.1	50.1	19.4	23	5	8	15	36	14
	2025-2030	192.3	13.6	2.4	7.4	26.0	89.4	53.4	7	1	4	14	46	28
	2045-2050	267.5	8.4	1.3	4.9	23.3	116.3	113.2	3	1	2	9	43	42
Latin America and the Caribbean	1950-1955	14.0	6.8	0.9	1.4	1.8	2.3	0.7	49	7	10	13	17	5
	1995-2000	16.2	2.6	0.6	1.9	2.9	5.2	2.9	16	4	12	18	32	18
	2025-2030	25.6	1.2	0.4	1.7	4.2	10.2	7.7	5	1	7	17	40	30
	2045-2050	37.1	0.7	0.3	1.3	4.0	14.4	16.4	2	1	4	11	39	44

of them occurring in that age range by 2045-2050, and 60 per cent being to persons aged 80 years or more. Latin America and the Caribbean, Asia and Oceania are also expected to display high concentrations of deaths at ages 60 or over, ranging between 83 per cent and 90 per cent. In Asia and Latin America and the Caribbean, deaths to older persons will be fairly evenly distributed among age groups 60-79 and 80 or over (each accounting for about 40 per cent of all deaths). In Oceania 55 per cent of all deaths are expected to be of persons aged 80 years or over. Only Africa is expected to have a "younger" age distribution of deaths by 2045-2050, with 10 per cent of deaths taking place before age five and 50 per cent at ages 60 or over.

Over the 1950-2050 period, relatively few countries have accounted or are expected to account for 75 per cent of the world's deaths. Table II.26 displays those countries at four different periods. Between 1950-1955 and 1995-2000 the number of countries accounting for three-quarters of all deaths rose from 19 to 27 and that number is expected to remain fairly stable during the next 50 years. In 2045-2050, 25 countries will likely account for 75 per cent of all deaths in the world. The countries accounting for large numbers of deaths generally belong to two categories: populous countries with relatively low mortality levels and countries with smaller populations where mortality levels are high. Japan belongs to the first category. With the lowest mortality in the world, it nevertheless accounts for a relatively large number of deaths both because of its population size and because of the rapid ageing of its population. Afghanistan is an example of the second category. It ranks among the countries producing large numbers of deaths in 1995-2000 and 2025-2030 not so much because of its population size but rather because its mortality is very high.

The number of more developed countries among those accounting for 75 per cent of all deaths has remained fairly stable and is expected to continue to do so in the future. The biggest change occurred between 1950-1955 and 1995-2000, when that number rose from six to eight. The United States, the Russian Federation, Japan, Germany, the United Kingdom and France, in order of number of deaths, were part of the group in 1950-1955. They were joined by Italy and the Ukraine in 1995-2000. Between 2025-2030 and 2045-2050, the Ukraine will drop out of the group and, with the exception of that for the United States, the ranks of all other developed countries in the group will drop as they account for lower proportions of the deaths at the world level. Only the United States is expected to keep third place during the whole 2000-2050 period. The United States, together with China and India, which occupy first and second places, will likely account for 42 per cent of all deaths in 2045-2050, a significant increase from the 37 per cent share those countries had in 1995-2000. Indeed, as mortality levels decline universally, the most populous countries will increasingly account for most deaths in the world. Prominent among the list of countries with the largest number of deaths are Bangladesh, Brazil, Egypt, the Democratic Republic of the Congo, Ethiopia, Indonesia, Mexico, Nigeria, Pakistan and the Philippines, all of them countries with large populations.

In sum, the expected continued decline of mortality will be accompanied by a rising average age at death and a concentration of most deaths at increasingly higher ages. As more countries reach low levels of mortality, the number of deaths they experience will be determined more strongly by the size of their populations than by mortality levels. Despite the expected declines in the risks of dying, both the number of deaths and the crude death rates are expected to rise as a result of population ageing. Most regions of the world are projected to see their expectations of life increase to levels that were until recently unprecedented in human history. However, for the least developed countries, even the substantial improvements expected by 2050 will not manage to eliminate the gap existing between them and the rest of the world, and given the setbacks that have occurred recently in many of those countries, it may not be at all certain that the projected improvements will be achieved.

TABLE II.26. COUNTRIES ACCOUNTING FOR 75 PER CENT OF ALL DEATHS FOR SELECTED PERIODS: ESTIMATES AND MEDIUM VARIANT, 1950-2050

	Country or area	*Number of deaths 1950-1955 (thousands)*	*Cumulated percentage*		*Country or area*	*Number of deaths 1995-2000 (thousands)*	*Cumulated percentage*		*Country or area*	*Number of deaths 2025-2030 (thousands)*	*Cumulated percentage*		*Country or area*	*Number of deaths 2045-2050 (thousands)*	*Cumulated percentage*
1	China	72 735	28	1	India	43 666	16	1	China	67 658	20	1	China	95 432	21
2	India	47 794	46	2	China	43 344	33	2	India	53 868	35	2	India	73 555	38
3	Indonesia	10 815	51	3	United States of America	11 747	37	3	United States of America	15 932	40	3	United States of America	21 153	42
4	United States of America	7 789	54	4	Russian Federation	10 515	41	4	Indonesia	10 312	43	4	Indonesia	14 781	46
5	Bangladesh	6 224	56	5	Indonesia	7 702	44	5	Russian Federation	9 224	46	5	Brazil	12 643	49
6	Pakistan	5 221	58	6	Nigeria	7 527	47	6	Brazil	9 048	48	6	Pakistan	10 623	51
7	Russian Federation	5 106	60	7	Pakistan	7 127	50	7	Nigeria	8 770	51	7	Bangladesh	9 960	53
8	Brazil	4 499	62	8	Bangladesh	6 398	52	8	Pakistan	7 882	53	8	Nigeria	9 949	55
9	Nigeria	4 368	63	9	Brazil	5 817	54	9	Japan	7 530	55	9	Russian Federation	9 231	57
10	Japan	4 058	65	10	Ethiopia	5 628	56	10	Bangladesh	6 838	57	10	Japan	7 915	59
11	Germany	3 856	66	11	Japan	4 816	58	11	Ethiopia	6 525	59	11	Mexico	6 805	61
12	Viet Nam	3 437	68	12	Germany	4 383	60	12	Germany	5 183	61	12	Ethiopia	6 119	62
13	Republic of Korea	3 342	69	13	Ukraine	3 703	61	13	Dem. Rep. of the Congo	4 349	62	13	Germany	5 620	63
14	Ethiopia	3 088	70	14	Dem. Rep. of the Congo	3 599	63	14	Mexico	4 294	63	14	Viet Nam	5 567	65
15	United Kingdom	2 973	71	15	United Kingdom	3 196	64	15	South Africa	4 077	64	15	Dem. Rep. of the Congo	5 122	66
16	Egypt	2 792	72	16	Italy	2 982	65	16	Italy	3 725	65	16	Philippines	4 812	67
17	France	2 718	73	17	France	2 744	66	17	United Kingdom	3 554	66	17	Turkey	4 676	68
18	Turkey	2 619	74	18	Myanmar	2 713	67	18	Viet Nam	3 411	67	18	Thailand	4 657	69
19	Mexico	2 533	75	19	Viet Nam	2 626	68	19	France	3 391	68	19	Egypt	4 619	70
				20	Mexico	2 405	69	20	Turkey	3 121	69	20	Iran (Islamic Rep. of)	4 527	71
				21	South Africa	2 255	70	21	Afghanistan	3 104	70	21	United Kingdom	4 188	72
				22	Afghanistan	2 250	71	22	Thailand	3 061	71	22	Italy	4 025	73
				23	Uganda	2 208	71	23	Philippines	3 047	72	23	France	3 960	74
				24	Egypt	2 207	72	24	Egypt	3 036	73	24	Myanmar	3 655	74
				25	United Rep. of Tanzania	2 186	73	25	Ukraine	2 904	74	25	Republic of Korea	3 445	75
				26	Turkey	2 074	74	26	Iran (Islamic Rep. of)	2 805	74				
				27	Philippines	1 976	75	27	Myanmar	2 721	75				
	WORLD	259 740	100		WORLD	265 111	100		WORLD	344 717	100		WORLD	447 915	100