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# World Population Prospects The 2000 Revision

## Highlights\*

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\* This report presents the highlights of the *2000 Revision* of the official United Nations population estimates and projections. The United Nations population estimates and projections are being released through a series of publications, wall charts, electronic databases and on the internet ([www.un.org/esa/population/unpop.htm](http://www.un.org/esa/population/unpop.htm)). For further information about the United Nations *2000 Revision*, please contact Mr. Joseph Chamie, Director, Population Division, United Nations, New York, NY 10017, USA (tel.: (212) 963-3179, fax: (212) 963-2147).

## **NOTE**

The designations employed in this report and the material presented in it do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The term “country” as used in the text of this report also refers, as appropriate, to territories or areas. The designations “more developed”, “less developed” and “least developed” countries, areas or regions are intended for statistical convenience and do not necessarily express a judgement about the stage reached by a particular country or area in the developing process.

## PREFACE

This report presents the highlights from the results of the *2000 Revision* of the official world population estimates and projections prepared by the Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat. The *2000 Revision* is the sixteenth round of global demographic estimates and projections undertaken by the Population Division since 1950.

The full results of the *2000 Revision* will be presented in a series of three volumes currently under preparation. The first two will be issued as working papers by mid-2001. The first volume<sup>1</sup> will provide the comprehensive tables presenting the major demographic indicators for each country for 1950-2050; the second volume<sup>2</sup> will contain the distributions by age and sex of the population of each country for the period 1950-2050, and the third volume<sup>3</sup> will be devoted to an in-depth analysis of the results obtained.

Data will also be distributed in digital form. Interested users can purchase data sets containing the major results of the *2000 Revision*. A description of these data sets and an order form are posted on the Population Division's web site (see address below).

Responsibility for the *2000 Revision* rests with the Population Division. Preparation of the *2000 Revision* was facilitated by the collaboration of the regional commissions, the specialized agencies and other relevant bodies of the United Nations with the Population Division. The Population Division is also grateful to the Statistics Division of the Department of Economic and Social Affairs for its continuing cooperation.

Selected output from the *2000 Revision* as well as other population information may be accessed on the world wide web site of the Population Division at [www.un.org/esa/population/unpop.htm](http://www.un.org/esa/population/unpop.htm). For further information about the *2000 Revision*, please contact Mr. Joseph Chamie, Director, Population Division, United Nations, New York, NY 10017, USA (tel.: (212) 963-3179, fax: (212) 963-2147, e-mail: [population@un.org](mailto:population@un.org)).

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<sup>1</sup>*World Population Prospects: The 2000 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, forthcoming 2001).

<sup>2</sup>*World Population Prospects: The 2000 Revision*, vol. II, *Sex and Age Distribution of the World Population* (United Nations publication, forthcoming 2001).

<sup>3</sup>*World Population Prospects: The 2000 Revision*, vol. III, *Analytical Report* (United Nations publication, forthcoming).



## EXECUTIVE SUMMARY

The *2000 Revision* is the sixteenth round of global demographic estimates and projections undertaken by the Population Division of the Department of Economic and Social Affairs since 1950. These population estimates and projections provide the standard and consistent set of population figures that are used throughout the United Nations system as the basis for activities requiring population information.

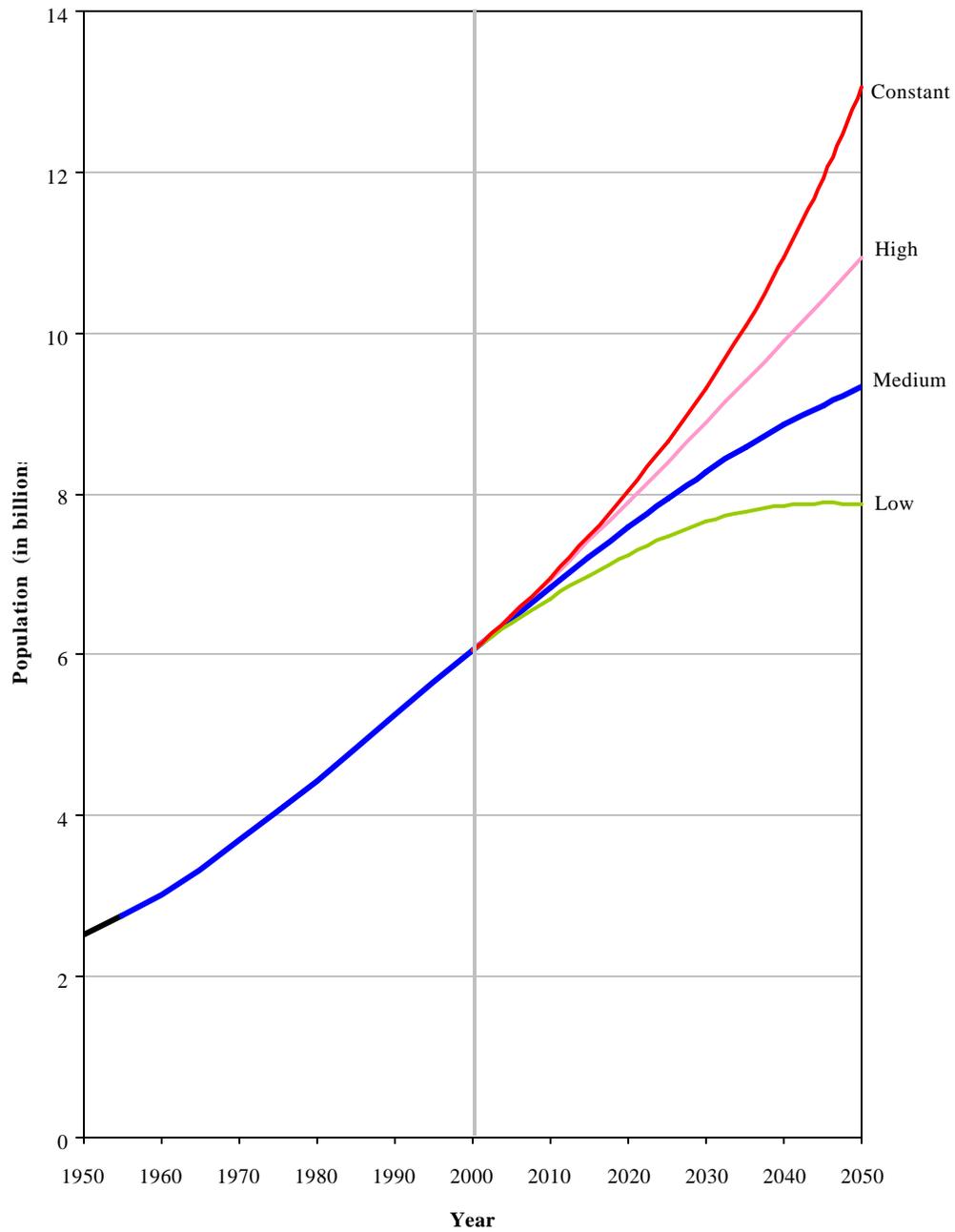
Among the key findings of the *2000 Revision* are:

1. World population reached 6.1 billion in mid-2000 and is currently growing at an annual rate of 1.2 per cent, or 77 million people per year. Six countries account for half of this annual growth: India for 21 per cent; China for 12 per cent; Pakistan for 5 per cent; Nigeria for 4 per cent; Bangladesh for 4 per cent, and Indonesia for 3 per cent. By 2050, world population is expected to be between 7.9 billion (low variant) and 10.9 billion (high variant), with the medium variant producing 9.3 billion (figure I).
2. The population of more developed regions, currently 1.2 billion, is anticipated to change little during the next 50 years because fertility levels are expected to remain below replacement level<sup>1</sup>. However, by mid-century the populations of 39 countries are projected to be smaller than today (e.g., Japan and Germany 14 per cent smaller; Italy and Hungary 25 per cent smaller; and the Russian Federation, Georgia and Ukraine between 28 to 40 per cent smaller).
3. The population of the less developed regions is projected to rise steadily from 4.9 billion in 2000 to 8.2 billion in 2050 (medium variant). This projection assumes continuing declines in fertility; in the absence of such declines, the population of less developed regions would reach 11.9 billion instead of the projected 8.2 billion. Particularly rapid growth is expected among the group of 48 countries classified as least developed. Their population is expected to nearly triple between 2000 and 2050, passing from 658 million to 1.8 billion, despite the fact that their fertility is projected to decline markedly in the future.
4. The difference between the projected population in 2050 according to the *2000 Revision* (9.3 billion) and that projected in the *1998 Revision* (8.9 billion) is 413 million people. Higher future fertility levels projected for the 16 developing countries whose fertility has not yet shown signs of a sustained decline are responsible for 59 per cent of that difference. The somewhat higher recent fertility estimated in the *2000 Revision* for several populous countries (e.g., Bangladesh, India and Nigeria) accounts for a further 32 per cent of that difference.
5. For 1995-2000, life expectancy at birth in the more developed regions is estimated to be 75 years. In the less developed regions, life expectancy was nearly 12 years lower, at 63 years. By 2050 the less developed regions are expected to attain a life expectancy of 75 years whereas in the more developed regions the projected level is 82 years, implying that the gap between the two groups may narrow.

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<sup>1</sup> Replacement-level fertility is the level necessary to ensure that the population replaces itself over the long run. For most populations, replacement is ensured with a fertility of 2.1 children per woman.

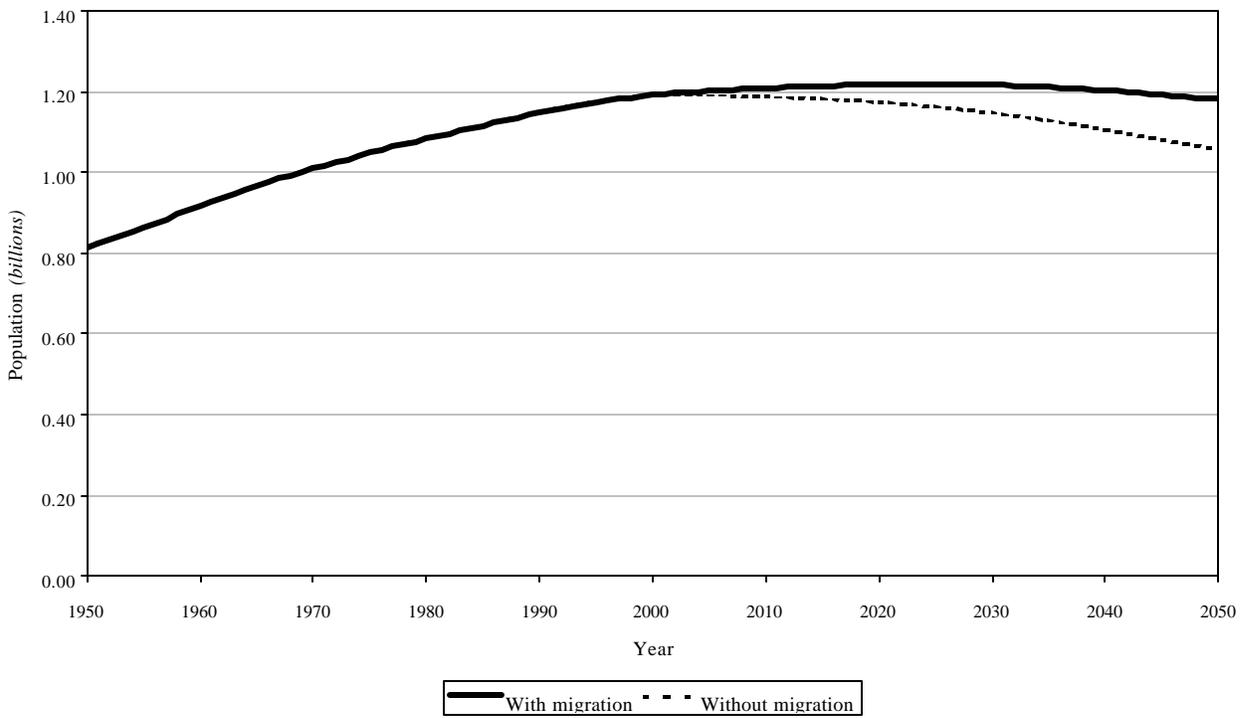
**Figure I. Estimated and projected population of the world by projection variant, 1950-2050**



Source: United Nations Population Division.

6. The *2000 Revision* indicates a worsening of the impact of the HIV/AIDS epidemic in terms of increased morbidity, mortality and population loss. During the next five years, for example, the number of excess deaths because of AIDS among the 45 most affected countries (up from the 34 considered in the *1998 Revision*) is estimated at 15.5 million. Despite the devastating impact of the HIV/AIDS epidemic, the populations of the most affected countries are expected to be larger by mid-century than today. This is due to continuing high fertility in these countries. For the nine most affected countries in Africa (with HIV prevalence at or above 14 per cent), the population is projected to increase from 115 million in 2000 to 196 million in 2050. Even in Botswana, where HIV prevalence is 36 per cent or in Swaziland and Zimbabwe, where it is above 25 per cent, the population is projected to increase significantly between 2000 and 2050: by 37 per cent in Botswana, 148 per cent in Swaziland and 86 per cent in Zimbabwe. Only in South Africa, whose fertility is lower than that of Botswana or Zimbabwe, does the growth rate of the population become negative during 2010-2025, being positive thereafter.
7. Although the probability of being infected by HIV is assumed to decline significantly in the future (particularly after 2015), the long-term impact of the epidemic remains dire. For the 45 most affected countries, the expectation of life at birth for these countries has already been reduced by nearly 3 years. By 2015, expectation of life is projected to stand at 60 years, 5 years lower than it would have been in the absence of HIV/AIDS.
8. Globally the number of older persons (60 years or over) will more than triple, increasing from 606 million today to nearly 2 billion by 2050. The increase in the number of the oldest old (80 years or over) is expected to be even more marked, passing from 69 million in 2000 to 379 million in 2050, more than a five-fold increase.
9. The population aged 60 or over in the more developed regions constitutes today about 20 per cent of the population and by 2050, it will likely account for 33 per cent of the population. The older population of the more developed regions has already surpassed the child population (persons aged 0-14) and by 2050 there will be 2 older persons for every child. In the less developed regions, the proportion of the population aged 60 or over will rise from 8 per cent in 2000 to close to 20 per cent in 2050.
10. International migration is projected to remain high during the 21<sup>st</sup> century. The more developed regions are expected to continue being net receivers of international migrants, with an average gain of about 2 million per year over the next 50 years. Because of low fertility, this migration has a significant impact on population growth in the more developed regions. Without migration, the population of more developed regions as a whole would start declining in 2003 rather than in 2025, and by 2050 it would be 126 million less than the 1.18 billion projected under the assumption of continued migration (figure II).

**Figure II. Population of more developed regions by medium variant with and without migration, 1950-2050**



Source: United Nations Population Division.

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## Explanatory notes

Tables presented in this Executive Summary make use of the following symbols:

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

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

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

A minus sign (-) before a figure indicates a decrease.

A full stop (.) is used to indicate decimals.

Years given start on 1 July.

Use of a hyphen (-) between years, for example, 1995-2000, signifies the full period involved, from 1 July of the first year to 1 July of the second year.

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

Countries and areas are grouped geographically into six major areas: Africa; Asia; Europe; Latin America and the Caribbean; Northern America; and Oceania. These major areas are further divided into 21 geographical regions. In addition, for statistical convenience, the regions are classified as belonging to either of two categories: more developed or less developed. The less developed regions include all the regions of Africa, Asia (excluding Japan), and Latin America and the Caribbean, as well as Melanesia, Micronesia and Polynesia. The more developed regions comprise Australia/New Zealand, Europe, Northern America and Japan.

The group of least developed countries currently comprises 48 countries: Afghanistan, Angola, Bangladesh, Benin, Bhutan, Burkina Faso, Burundi, Cambodia, Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of the Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Haiti, Kiribati, Lao People's Democratic Republic, Lesotho, Liberia, Madagascar, Malawi, Maldives, Mali, Mauritania, Mozambique, Myanmar, Nepal, Niger, Rwanda, Samoa, Sao Tome and Principe, Sierra Leone, Solomon Islands, Somalia, Sudan, Togo, Tuvalu, Uganda, United Republic of Tanzania, Vanuatu, Yemen and Zambia.

The following abbreviations have been used:

AIDS	Acquired immunodeficiency syndrome
HIV	Human immunodeficiency virus
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNHCR	Office of the United Nations High Commissioner for Refugees



## WORLD POPULATION TRENDS

The world population reached 6.1 billion at mid-2000 and is projected to grow to 9.3 billion by 2050 according to the medium variant (table 1). In this variant, total fertility at the world level is expected to decline from 2.82 children per woman in 1995-2000 to 2.15 children per woman in 2045-2050 and the expectation of life at birth is expected to increase from 65 years to 76 years between 1995-2000 and 2045-2050. As a consequence of the expected reduction of fertility, the population growth rate drops from 1.35 per cent per year in 1995-2000 to 0.47 per cent per year in 2045-2050.

TABLE 1. ESTIMATED AND PROJECTED POPULATION OF THE WORLD, MAJOR DEVELOPMENT GROUPS AND MAJOR AREAS, 1950, 2000 AND 2050 ACCORDING TO THE DIFFERENT FERTILITY VARIANTS

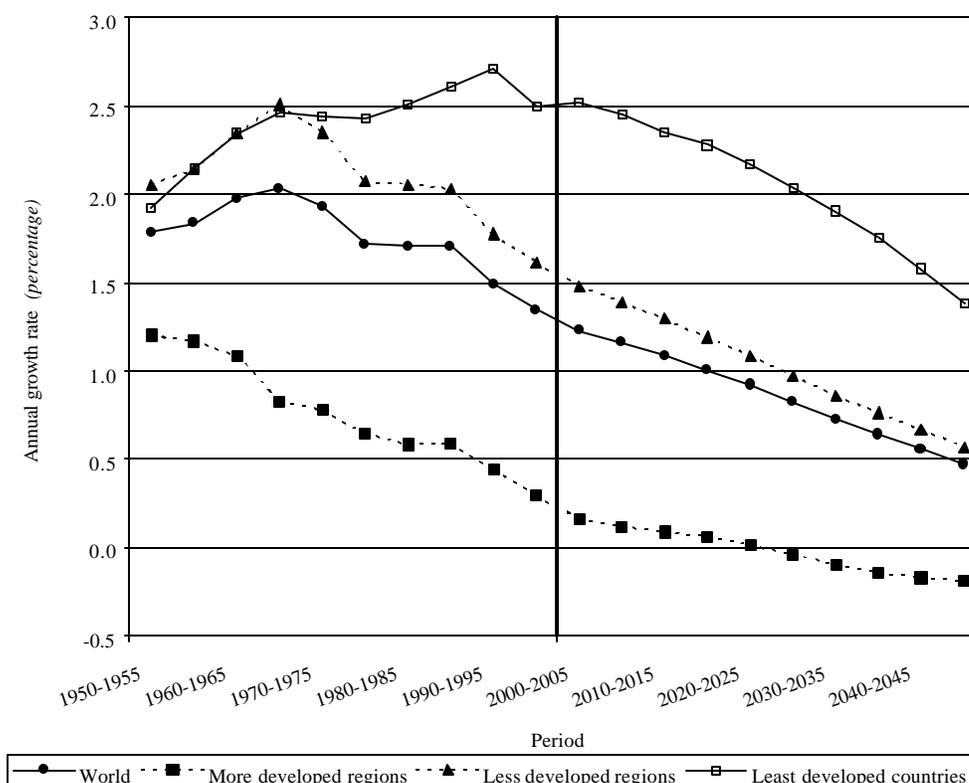
Major area	Estimated population (millions)		Population in 2050 (millions)			
	1950	2000	Low	Medium	High	Constant
World .....	2 519	6 057	7 866	9 322	10 934	13 049
More developed regions .....	814	1 191	1 075	1 181	1 309	1 162
Less developed regions .....	1 706	4 865	6 791	8 141	9 625	11 887
Least developed countries .....	197	658	1 545	1 830	2 130	3 150
Other less developed countries .....	1 508	4 207	5 246	6 312	7 495	8 738
Africa .....	221	794	1 694	2 000	2 320	3 566
Asia .....	1 399	3 672	4 527	5 428	6 430	7 376
Latin America and Caribbean .....	167	519	657	806	975	1,025
Europe.....	548	727	556	603	654	580
Northern America.....	172	314	389	438	502	446
Oceania .....	13	31	42	47	53	56

Source: United Nations Population Division.

Population growth is projected to slow down in both the more developed and the less developed regions. However, whereas the growth rate remains positive for the less developed regions until 2050, it turns negative after 2025 for the more developed regions. By 2045-2050, the population in the more developed regions is projected to be declining at a rate of -0.19 per cent per year, whereas the population of the less developed regions will be growing at a robust rate of 0.57 per cent per year (figure 1).

The difference in growth trajectories between the more developed and the less developed regions is mainly the product of their current levels of fertility and the path fertility is expected to follow in the future. Although considerable differences in fertility exist among the countries of the more developed regions, in virtually all of them fertility is currently below replacement level (i.e. below 2.1 children per woman) and, although it is projected to rise somewhat in the future, it will generally remain below replacement level until 2050. Thus, for the more developed regions as a whole, total fertility is expected to decline from 1.57 children per woman in 1995-2000 to 1.50 children per woman in 2005-2010 and then to rise slowly to 1.92 children per woman in 2045-2050 (figure 2).

**Figure 1. Annual growth rate for the world and major development groups, 1950-2050**

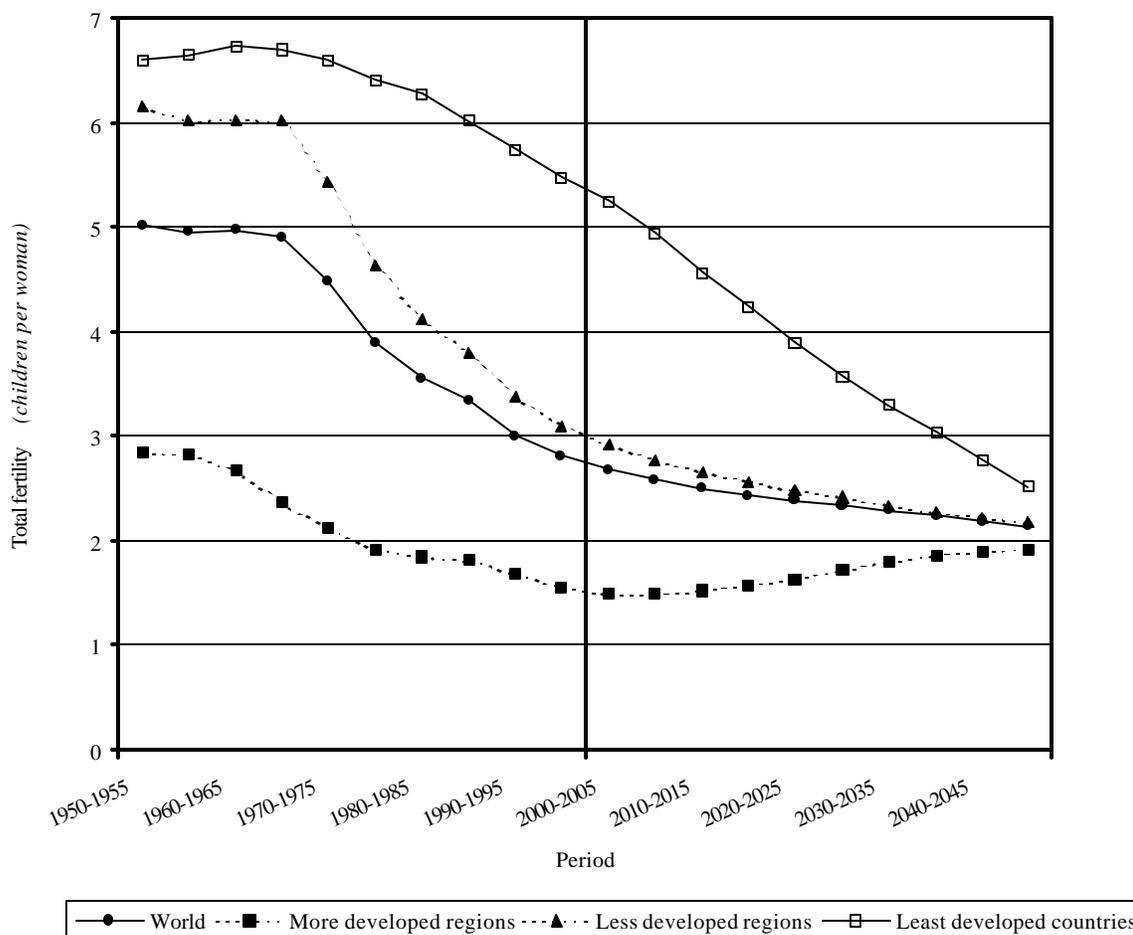


Source: United Nations Population Division.

In contrast, in the less developed regions as a whole, fertility is still above replacement level (at 3.1 children per woman in 1995-2000) and is projected to remain above replacement level until 2045-2050 when it reaches 2.17 children per woman. However, these averages mask the considerable heterogeneity that characterizes fertility levels in developing countries. Indeed, the less developed regions include both low-fertility countries such as China, where fertility is already below replacement level, and a number of high-fertility countries, such as Afghanistan, Niger or Yemen, where fertility has not yet shown signs of declining. For the latter group, fertility levels over the next five years are expected to remain high and although reductions are projected thereafter at a rate of one child per decade, replacement level is not necessarily reached by 2045-2050.

Most high-fertility countries, including those that have not yet experienced a decline of fertility or where the decline is incipient, belong to the group of least developed countries. Consequently, relatively high fertility still characterizes that group of countries and is expected to do so in the future (table 2). In 1995-2000, the 48 least developed countries had a total fertility of 5.74 children per woman, which is projected to decline to 2.51 children per woman in 2045-2050, a level that is still well above the replacement level of 2.1 children per woman. In contrast, the rest of the countries in the less developed regions exhibit a total fertility of 3.06 children per woman in 1995-2000 and are projected to have 2.06 children per woman in 2045-2050.

**Figure 2. Total fertility trajectories in the medium variant for the world and major development groups, 1950-2050**



Source: United Nations Population Division.

Equally striking are the differences in expectation of life at birth (table 3 and figure 3). The more developed regions experience the lowest mortality and have, therefore, higher levels of life expectancy at birth than the less developed regions as a whole (75 years vs. 63 years in 1995-2000). Although the gap between the two groups of countries is expected to narrow over the next fifty years, by 2045-2050 the more developed regions are still expected to have considerably higher life expectancy at birth than the less developed regions (82 years vs. 75 years).

Within both the more developed and the less developed regions, certain groups of countries have higher mortality than the rest. For example, in the more developed regions, Eastern Europe has experienced increased mortality over the past decade and exhibits relatively low levels of life expectancy at birth (68 years in 1995-2000). By 2045-2050, Eastern Europe's projected life expectancy, at 78 years, remains the lowest among those of the more developed regions.

TABLE 2. ESTIMATED AND PROJECTED TOTAL FERTILITY FOR THE WORLD, MAJOR DEVELOPMENT GROUPS AND MAJOR AREAS, 1995-2000 AND 2045-2050 ACCORDING TO FERTILITY VARIANT

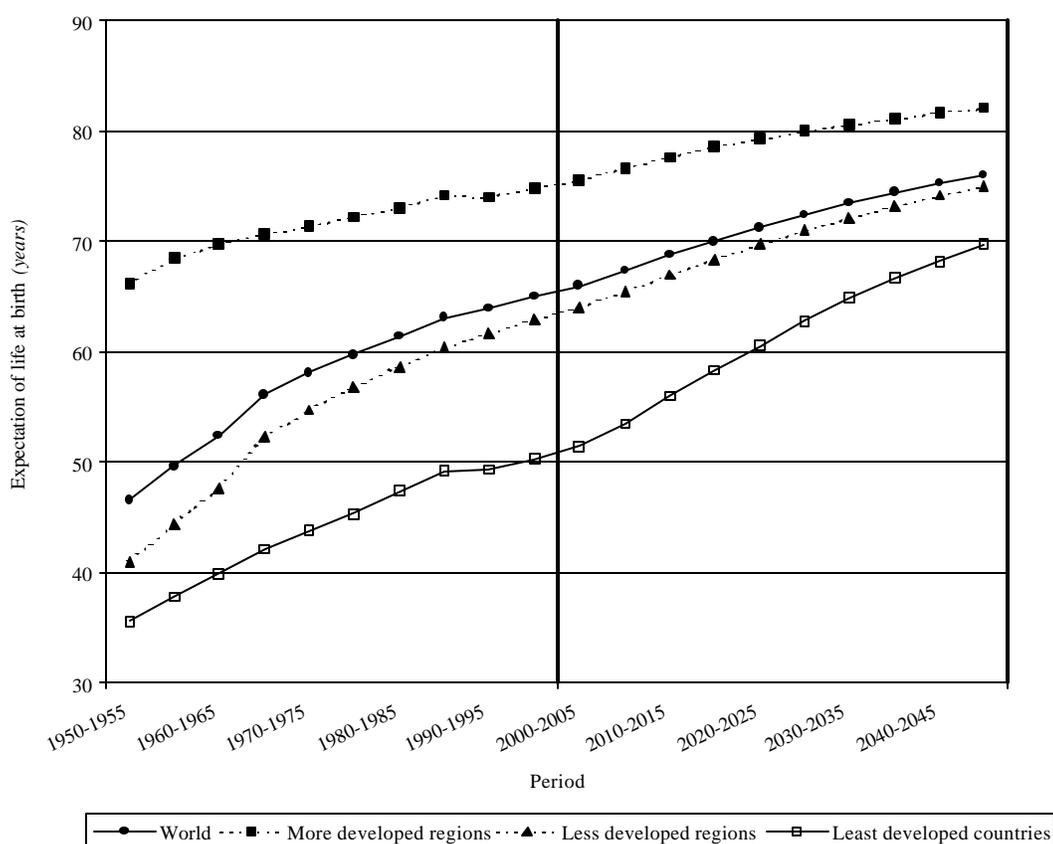
<i>Major area</i>	<i>1995-2000</i>	<i>Total fertility (average number of children per woman)</i>			
		<i>2045-2050</i>			
		<i>Low</i>	<i>Medium</i>	<i>High</i>	<i>Constant</i>
World .....	2.82	1.68	2.15	2.62	3.87
More developed regions .....	1.57	1.52	1.92	2.33	1.70
Less developed regions .....	3.10	1.70	2.17	2.65	4.06
Least developed countries .....	5.47	2.02	2.51	3.02	5.90
Other less developed countries .....	2.78	1.58	2.05	2.53	3.43
Africa .....	5.27	1.91	2.39	2.88	5.78
Asia .....	2.70	1.60	2.08	2.56	3.40
Latin America and Caribbean .....	2.69	1.60	2.10	2.59	2.93
Europe .....	1.41	1.41	1.81	2.20	1.43
Northern America .....	2.00	1.68	2.08	2.48	2.01
Oceania .....	2.41	1.61	2.06	2.50	3.11

Source: United Nations Population Division

TABLE 3. EXPECTATION OF LIFE AT BIRTH FOR THE WORLD, MAJOR DEVELOPMENT GROUPS AND MAJOR AREAS, 1995-2000 AND 2045-2050

<i>Major area</i>	<i>1995-2000</i>	<i>2045-2050</i>
World .....	65.0	76.0
More developed regions .....	74.9	82.1
Less developed regions .....	62.9	75.0
Least developed countries .....	50.3	69.7
Other less developed countries .....	65.5	76.6
Africa .....	51.4	69.5
Asia .....	65.8	77.1
Latin America and Caribbean .....	69.3	77.8
Europe .....	73.2	80.8
Northern America .....	76.7	82.7
Oceania .....	73.5	80.6

Source: United Nations Population Division

**Figure 3. Expectation of life for the world and the major development groups, 1950-2050**

Source: United Nations Population Division.

Among the less developed regions, those that are highly affected by the HIV/AIDS epidemic have some of the lowest life expectancies recorded in recent times and are projected to experience continued high mortality over the next fifty years. Sub-Saharan Africa in particular, with 35 highly affected countries in 1999, had an estimated life expectancy of 49 years in 1995-2000, one year lower than it was ten years earlier (50 years). By 2010-2015, life expectancy is expected to show some recuperation, rising to 52 years. Yet, although the incidence of HIV infection is projected to decline, by 2045-2050 life expectancy in Sub-Saharan Africa is still expected to be the lowest among the world's major areas (68 years).

The 48 least developed countries, which include 26 of the countries that are highly affected by HIV/AIDS, experience fairly high mortality levels. Their life expectancy at birth was 50 years in 1995-2000 and is expected to remain relatively low during the next fifty years, reaching 70 years in 2045-2050.

Despite being subject to high mortality, the population of the least developed countries is expected to almost triple between 2000 and 2050, rising from 658 million to 1.83 billion. The high fertility levels prevailing in the least developed countries are largely responsible for this

increase. Growth will also be substantial in the rest of the developing countries, whose population is projected to increase from 4.2 billion to 6.3 billion between 2000 and 2050. Consequently, the population of the less developed regions as a whole is projected to increase from 4.9 billion in 2000 to 8.1 billion in 2050.

The effect of declining fertility on population growth in the less developed regions can be judged by considering that, if fertility were to remain constant at 1995-2000 levels, the population of the less developed regions would reach 11.9 billion in 2050, nearly 4 billion more than projected under the medium variant.

In the more developed regions, the population is projected to grow slightly between 2000 and 2025, rising from 1.19 billion to 1.22 billion, only to decline thereafter to reach 1.18 billion by 2050. If fertility were to remain constant at the levels reached in 1995-2000, the total population in 2050 would not be very different (1.16 billion), partly because a considerable part of the population growth in more developed regions is associated with the projected net inflow of international migrants. If net migration from the less developed regions to the more developed regions were zero, the population of more developed regions would be 1.06 billion in 2050, 126 million less than in the medium variant, and population decline would set in by 2003 instead of 2025.

## FERTILITY

According to the *2000 Revision*, total fertility, that is, the average number of children a woman would bear if fertility rates remained unchanged during her lifetime, was 2.82 in 1995-2000 at the world level. This average results from very varied experiences at the country level. In 1995-2000, 64 countries or areas (43 of them located in the more developed regions) experienced fertility levels at or below the replacement level<sup>2</sup>, whereas 123 countries or areas (122 of which are located in the less developed regions) experienced a total fertility greater than 2.1 children per woman. Among the latter, 48 had total fertility levels at or above 5 children per woman and the majority of them are among the countries classified as least developed.

In 2000, the 64 countries where total fertility was at or below-replacement level accounted for 44 per cent of the world's population or 2.7 billion people, whereas the countries with above-replacement fertility had 3.4 billion persons in 2000 or 56 per cent of the world population. Because of their low fertility and the expectation that it will not rise markedly in the future, the countries with below-replacement fertility are projected to have only a slightly larger population in 2050 than today (2.9 billion persons). In contrast, the countries whose fertility is currently above replacement level are expected to experience a marked population increase, reaching 6.4 billion by 2050 and accounting then for 69 per cent of the global population.

The pace of fertility decline during 1950-2000 has varied significantly among developing countries. Although most countries in the less developed regions are already far advanced in the transition from high to low fertility, there are a number of countries that exhibit sustained high fertility and for which there is either no recent evidence about fertility trends or the available evidence does not indicate the onset of a fertility reduction. Among those countries, 16 currently have such high fertility levels, and even though their fertility is projected to decline after 2005 at a pace of one child per decade, it is not expected to reach replacement level by 2045-2050.

The high fertility of these 16 countries, with a combined population of 269 million in 2000, leads to very rapid population growth and their overall population nearly quadruples between 2000 and 2050, slightly surpassing 1 billion in 2050. The countries involved are: Afghanistan, Angola, Burundi, Burkina Faso, Chad, Congo, the Democratic Republic of Congo, Ethiopia, Liberia, Malawi, Mali, Niger, Somalia, Sierra Leone, Uganda and Yemen. They all belong to the group of least developed countries and several are already highly affected by the HIV/AIDS epidemic. In addition, a number of them have been experiencing civil strife and political instability in recent years, factors that militate against the provision of basic services for the population. Clearly, the continuation of rapid population growth poses serious challenges to their future development.

For a few populous countries that are already fairly advanced in the transition to low fertility, recent analyses of past fertility trends have indicated that the rapid declines that were previously assumed to have taken place in the 1990s had not materialized. For Bangladesh and Nigeria, for instance, estimated fertility for 1995-2000 is now believed to be higher than that projected for the same period in the *1998 Revision*. Consequently, projected fertility trends for the

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<sup>2</sup> Replacement-level fertility is the level that needs to be sustained over the long run to ensure that a population replaces itself. For most countries, replacement level is close to 2.1 children per woman.

next few decades are also higher in the *2000 Revision* than in the previous one. For India as well, a small upward revision of the fertility estimate for 1995-2000 results in a change of the fertility trajectory that its population is expected to follow in the future, a change that produces a significantly larger population size in 2050. Largely as a result of those changes, the total population of Bangladesh, India and Nigeria combined is now expected to reach 2.1 billion in 2050, a figure about 131 million higher than the one projected in the *1998 Revision*.

Similarly, for the 16 high-fertility countries mentioned above, the 2050 population projected by the *2000 Revision* is 243 million higher than that projected by the *1998 Revision*. In total, therefore, differences relative to the projected populations of the 16 high-fertility countries and those of Bangladesh, India and Nigeria amount to 374 million persons and account for about 91 per cent of the 413 million difference between the world population in 2050 as projected by the *2000 Revision* and the *1998 Revision*.

## THE DEMOGRAPHIC IMPACT OF HIV/AIDS

As in previous *Revisions*, the impact of HIV/AIDS has been explicitly incorporated in projecting the population of highly affected countries. In the 2000 *Revision*, 45 countries are in that category, up from 34 in the 1998 *Revision*. Among their population aged 15 to 49, HIV prevalence in 1999 was estimated to be 2 per cent or more. In addition, a few populous countries with lower prevalence levels were included because they had a large number of persons living with HIV.

Among those 45 countries, 35 are in Sub-Saharan Africa (Angola, Benin, Botswana, Burundi, Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea - Bissau, Kenya, Lesotho, Liberia, Malawi, Mali, Mozambique, Namibia, Nigeria, Rwanda, Sierra Leone, South Africa, Swaziland, Togo, Uganda, United Republic of Tanzania, Zambia, Zimbabwe), 4 in Asia (Cambodia, India, Myanmar and Thailand), and 6 in Latin America and the Caribbean (Bahamas, Brazil, Dominican Republic, Guyana, Haiti and Honduras). Of the 33 million adults in the world infected by HIV by 1999, 29 million or 88 per cent resided in those 45 countries (UNAIDS, 2000).

The 2000 *Revision* confirms yet again the devastating toll AIDS has in terms of increased morbidity, mortality and population loss. In the 35 highly affected countries of Africa, life expectancy at birth is estimated at 48.3 years in 1995-2000, 6.5 years less than it would have been in the absence of AIDS (table 4). By 2015, the population of these 35 African countries is projected to be 84 million, 10 per cent less than it would have been without AIDS (table 5). The demographic impact of AIDS is even more dramatic in the nine African countries with the highest HIV prevalence (at or above 14 per cent), namely, Botswana, Kenya, Lesotho, Malawi, Namibia,

TABLE 4. EXPECTATION OF LIFE AT BIRTH WITH AND WITHOUT AIDS FOR GROUPS OF AFFECTED COUNTRIES IN MAJOR AREAS AND FOR THE MOST AFFECTED COUNTRIES, 1995-2000, 2000-2005 AND 2010-2015

Country group or country	1995-2000		2000-2005		2010-2015	
	With AIDS	Without AIDS	With AIDS	Without AIDS	With AIDS	Without AIDS
All 45 affected countries .....	56.9	59.8	57.5	61.7	60.4	65.2
35 countries in Africa .....	48.3	54.8	48.2	57.1	52.4	61.2
4 countries in Asia .....	62.2	62.8	64.0	64.9	67.7	68.9
6 countries in Latin America and the Caribbean .....	66.1	66.9	67.2	68.2	69.5	70.7
9 countries with prevalence of 14 per cent or more .	49.3	61.5	45.3	63.6	47.5	67.1
The most affected countries:						
Botswana.....	44.4	67.6	36.1	69.7	43.0	73.0
South Africa.....	56.7	63.3	47.4	65.8	42.0	69.6
Swaziland.....	50.8	60.2	38.1	62.7	39.2	67.2
Zimbabwe .....	42.9	66.5	42.9	68.5	50.2	71.4

Source: United Nations Population Division.

TABLE 5. DIFFERENCE IN PROJECTED POPULATION WITH AND WITHOUT AIDS AND PERCENTAGE DIFFERENCE FOR GROUPS OF AFFECTED COUNTRIES IN MAJOR AREAS, 2000, 2015 AND 2050

Country group	2000		2015		2050	
	Population difference (000)	Percentage difference	Population difference (000)	Percentage difference	Population difference (000)	Percentage difference
All 45 affected countries .....	19 739	1	96 913	4	302 090	8
35 countries in Africa.....	17 069	3	83 693	10	267 019	15
4 countries in Asia .....	2 185	0	11 272	1	30 161	2
6 countries in Latin America and the Caribbean.....	485	0	1 948	1	4 910	2
9 countries with prevalence of 14 per cent or more	5 298	4	30 869	18	85 180	30

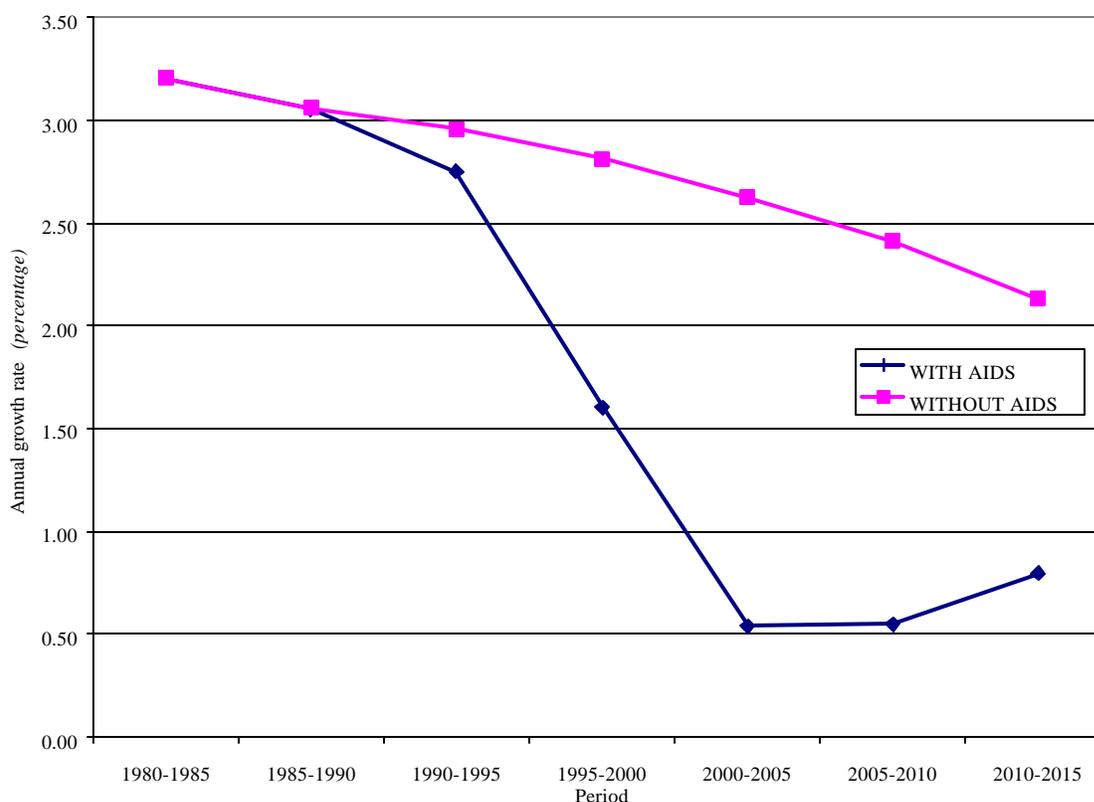
Source: United Nations Population Division.

South Africa, Swaziland, Zambia and Zimbabwe. In 1995-2000 average life expectancy in those countries was 49.3 years instead of the 61.5 years it would have been in the absence of AIDS, a reduction of 12 years. And the impact of HIV/AIDS is expected to intensify in the future. By 2005-2010, average life expectancy at birth in those countries is projected to decrease to 45 years instead of rising to 65 years as projected in the absence of the disease.

In Botswana, the country with the highest HIV prevalence, about one out of every 3 adults is HIV positive. Life expectancy has dropped from 60.2 years in 1990-1995 to 44.4 years in 1995-2000 and is projected to fall further to 36 years in 2000-2005, a figure about 34 years lower than the life expectancy projected in the absence of AIDS. Because of increased mortality, population growth in Botswana has been and is expected to be significantly reduced. The average annual population growth rate dropped from 3.2 per cent per year in 1980-1985 to 1.6 per cent in 1995-2000 and will likely fall further to 0.5 per cent between 2000 and 2010 (figure 4). In the absence of AIDS, Botswana's population would have experienced a growth rate higher than 2.5 per cent per year between 1990 and 2005. As a result, Botswana's population in 2015 is expected to be 28 per cent smaller than it would have been in the absence of AIDS. Yet, because of high fertility, Botswana's population is not projected to decrease during 2000-2050.

In Zimbabwe, another country with very high HIV prevalence, one out of every 4 adults is infected. Life expectancy at birth, estimated at 43 years in 1995-2000, is 23.5 years lower than it would have been without AIDS (66.5 years), and it is expected to remain unchanged at 43 years in 2000-2005. As in Botswana, the impact of HIV/AIDS on population growth in Zimbabwe has been staggering. Estimated at 3.8 per cent per year in 1980-1985, the annual growth rate fell to nearly 1.9 per cent in 1995-2000 and will likely fall further to 1.7 per cent in 2000-2005 (figure 5). In the absence of AIDS, Zimbabwe would have experienced annual growth of 3.1 per cent in 1995-2000 and 2.5 per cent in 2000-2005. As a result, in 2015 Zimbabwe's population is expected to be 22 per cent smaller than it would have been in the absence of the AIDS epidemic.

In Swaziland, where one out of every 4 adults is infected, the AIDS epidemic is also expected to take a devastating toll on human lives. Although the more recent start of the epidemic in that country means that life expectancy had been barely affected by 1990-1995, it is projected that by 2000-2005 nearly 25 years of life expectancy will be lost because of HIV/AIDS.

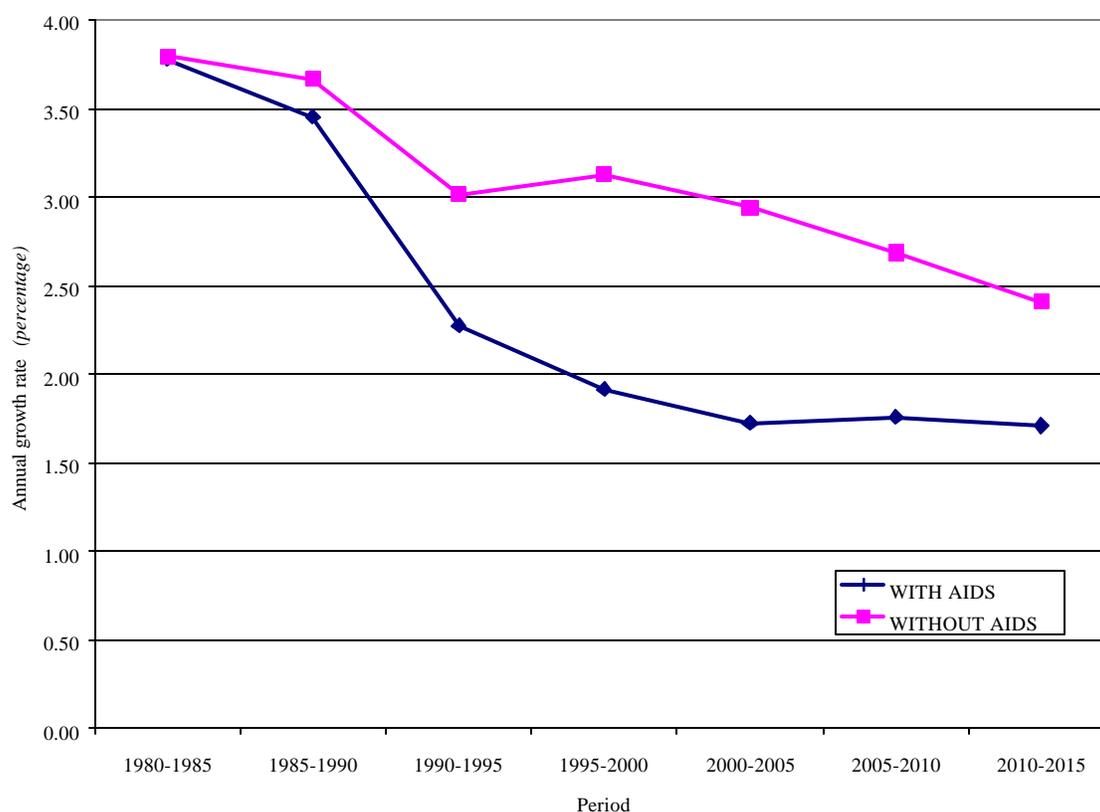
**Figure 4. Annual population growth rate, Botswana, 1980-1985 to 2010-2015**

Source: United Nations Population Division.

And the impact of the disease is projected to intensify in the next decade, so that, by 2005-2010, nearly 30 years of life expectancy will be lost to AIDS. At that time, life expectancy at birth is expected to be a low 35 years. Population growth, while remaining positive, is also expected to be markedly reduced because of the AIDS epidemic. Swaziland's annual growth rate is expected to decrease from 1.6 per cent in 1990-1995 to 0.4 per cent in 2005-2010 whereas in the absence of AIDS it would have been 2.4 per cent in 2005-2010. By 2015, Swaziland's population is expected to be 25 per cent smaller than it would have been in the absence of AIDS.

In the Republic of South Africa, the epidemic also started later than in other countries of the region. By 1999, one out of every 7 adults was infected by the disease. Because of its late start, the major demographic impact of the epidemic is yet to come. Although life expectancy had barely been affected in 1990-1995, by 2005-2010, it is projected to drop to 47.4 years, 18 years lower than it would have been without AIDS. Although the reduction of life expectancy caused by AIDS in Botswana or Zimbabwe is greater than that in South Africa, South Africa's lower fertility cannot counterbalance the higher death toll associated with the disease. Consequently, South Africa is the only highly affected country where population growth is expected to turn negative: its annual growth rate is projected to decrease from 1.9 per cent in 1990-1995 to nearly zero by 2005-2010 and become negative by 2010-2015. However, negative growth persists only

Figure 5. Annual population growth rate, Zimbabwe, 1980-1985 to 2010-2015



Source: United Nations Population Division.

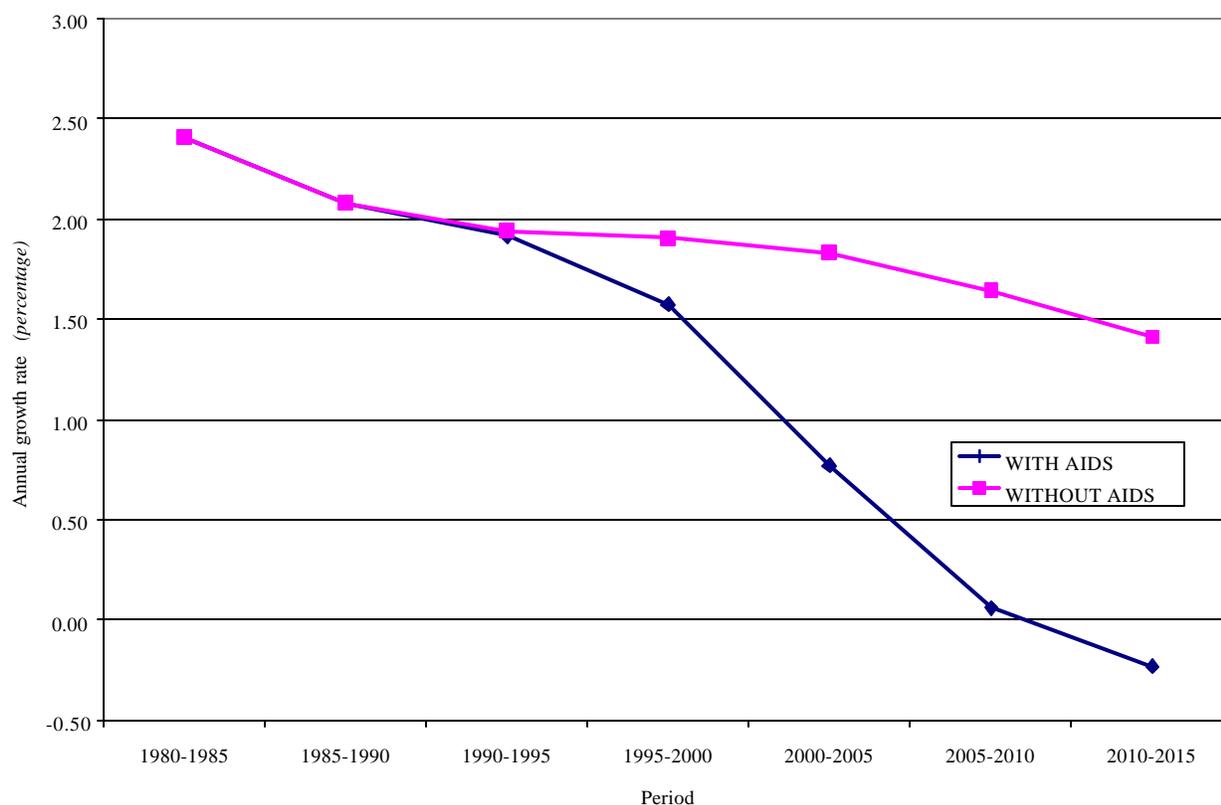
until 2025, with the growth rate becoming positive thereafter (figure 6). By 2015, South Africa's population is expected to be 21 per cent smaller than it would have been in the absence of the AIDS epidemic.

Compared to Africa, the relative impact of the HIV/AIDS epidemic in Asia or Latin American and the Caribbean is still low. Thus, whereas by 2015 the population of the 35 highly affected African countries is projected to be 10 per cent lower than it would have been in the absence of the disease, that of the 4 Asian countries affected and of the 6 countries in Latin America and the Caribbean will be just 1 per cent lower. However, because of the large populations of Brazil and India, the impact of the disease in terms of the estimated number of excess deaths is substantial. In Asia an estimated 2.2 million excess deaths will occur in 2000-2005 because of AIDS and in Latin America and the Caribbean the equivalent figure will be nearly 0.4 million (table 6). India alone is expected to experience 1.6 million excess deaths because of the AIDS epidemic. In comparison, the 35 affected countries in Africa are expected to experience 12.9 million excess deaths during 2000-2005.

Lastly, it should be emphasized that, although the demographic impact of HIV/AIDS outside of Africa remains relatively low, the number of countries where the prevalence of the

disease has become significant has been growing more rapidly in Asia and Latin America and the Caribbean than in Africa. Thus, the number of highly-affected countries in Asia and Latin America and the Caribbean doubled, from 5 to 10, between the *1998 Revision* and the *2000 Revision*. Clearly, the spread of HIV in Asia and Latin America and the Caribbean will require careful monitoring. While it is not yet certain that such spread will follow the pattern observed in Africa, rapid and effective responses may be required to avert the devastation that Africa is already experiencing.

**Figure 6. Annual population growth rate, South Africa, 1980-1985 to 2010-2015**



Source: United Nations Population Division.

**TABLE 6. EXCESS DEATHS IN A PROJECTION WITH AIDS IN RELATION TO A PROJECTION ASSUMING NO AIDS FOR GROUPS OF AFFECTED COUNTRIES IN MAJOR AREAS, 1995-2000, 2000-2005 AND 2010-2015**

Country group	1995-2000		2000-2005		2010-2015	
	Excess deaths (000)	Percentage increase	Excess deaths (000)	Percentage increase	Excess deaths (000)	Percentage increase
All 45 affected countries .....	10 010	11	15 468	17	17 877	19
35 countries in Africa .....	8 332	25	12 866	37	14 457	40
4 countries in Asia .....	1 412	3	2 230	5	2 976	6
6 countries in Latin America and the Caribbean .....	266	4	372	5	443	6
9 countries with prevalence of 14 per cent or more ...	2 958	61	5 361	110	6 526	128

Source: United Nations Population Division.

## POPULATION AGEING

As world fertility continues to decline and life expectancy rises, the population of the world will age faster in the next 50 years than during the past half century. An increase in the median age—the age that divides the population into two equal halves—is used as an indicator of the shift of the population age distribution towards older ages, which is known as population ageing. Over the past half century, the median age for the world increased 3 years, from 23.6 years in 1950 to 26.5 years in 2000. Over the next 50 years, the median age is expected to rise by 10 years, reaching 36.2 years in 2050 (table 7).

TABLE 7. MEDIAN AGE BY MAJOR AREA, 1950, 2000 AND 2050  
(medium variant)

	Median age (years)		
	1950	2000	2050
World total	23.6	26.5	36.2
Less developed regions .....	21.4	24.3	35.0
More developed regions .....	28.6	37.4	46.4
Least developed countries .....	19.5	18.2	26.5
Africa .....	19.0	18.4	27.4
Asia .....	22.0	26.2	38.3
Europe .....	29.2	37.7	49.5
Northern America .....	29.8	35.6	41.0
Latin America and Caribbean .....	20.1	24.4	37.8
Oceania .....	27.9	30.9	38.1

Source: United Nations Population Division.

The proportion of children (i.e., persons aged 0 to 14) has declined from 34 per cent in 1950 to 30 per cent in 2000, just as the proportion of older persons (those aged 60 years or over) has increased from 8 per cent to 10 per cent. Over the next 50 years, the proportion of children is projected to drop by a third, reaching 21 per cent in 2050, whereas the proportion of older persons will likely double, reaching 21 per cent.

The more developed regions have been leading the process of population ageing. In 1950, the proportion of children in these regions was 27 per cent while that of older persons was 12 per cent. By 2000, the proportion of older persons in the more developed regions had surpassed that of children (19 per cent vs. 18 per cent) and in 2050, the proportion of older persons is expected to be double that of children (33 per cent vs. 16 per cent). As a result of these changes, the median age in more developed regions, which rose from 28.6 years in 1950 to 37.4 in 2000, is projected to reach the unprecedented level of 46.4 years in 2050.

Until 2000, population ageing has been considerably slower in the less developed regions where fertility is still relatively high. The proportion of children declined from 38 per cent in 1950 to 33 per cent in 2000, while the proportion of older persons increased from 6 to 8 per cent, and a period of more rapid population ageing lies ahead. By 2050, the proportion of older persons in the less developed regions will rise to 19 per cent, whereas the proportion of children is expected to decline to 22 per cent. The median age, which had barely changed during 1950-2000

(passing from 21.4 years to 24.3) is projected to increase by 10 years, to reach 35 years in 2050. That is, by mid-century the less developed regions will likely have an age structure similar to that of today's more developed regions.

Population ageing will result in a rapid increase of the number of people aged 60 years or over. At the global level, that number will rise from 606 million in 2000 to almost two billion in 2050. The absolute increase will be less marked in the more developed regions, where the number of older persons is projected to rise from 231 million in 2000 to 395 million in 2050, but it will be dramatic in the less developed regions, where the older population will more than quadruple, from 374 million in 2000 to 1.6 billion in 2050.

Europe is the major area of the world where population ageing is most advanced. The proportion of children is projected to decline from 17 per cent in 2000 to 14 per cent in 2050, while the proportion of older persons will increase from 20 per cent in 1998 to 37 per cent in 2050. By then, there will be 2.6 older persons for every child and more than one in every three persons will be aged 60 years or over. As a result, the median age will rise from 37.5 years in 2000 to 49.5 in 2050.

Japan is currently the country with the oldest population (its median age is 41 years), followed by Italy, Switzerland, Germany and Sweden, with median ages of 40 years each. In 2050, Spain is projected to have the oldest population, with a median age of 55 years. Italy, Slovenia and Austria, with median ages of 54 years each, will also have populations where persons aged 50 or over predominate. In fact, in Germany, Greece, Italy and Japan there are already at least 1.5 persons aged 60 or over for every child and by 2050 Italy and Spain are each expected to have nearly 4 older persons per child.

Africa remains the major area with the youngest population. However, the proportion of children in the continent is expected to decline from 43 per cent in 2000 to 28 per cent in 2050, and the proportion of older persons will likely double from 5 per cent to 10 per cent over the next 50 years.

### **The oldest old**

In 2000, 69 million persons in the world were aged 80 or over (the oldest old) and they were the fastest growing segment of the population (table 8). By 2050, they are projected to reach 379 million, increasing more than 5.5 times. Although the proportion of the oldest old is still low (1 per cent of the world population), it will rise to 4 per cent in 2050. Currently, the oldest old already constitute 3.2 per cent of the population of Northern America and 3 per cent of the population of Europe. In Sweden, 5.1 per cent of the population is aged 80 or over, while in Norway and the United Kingdom the equivalent proportion is above 4 per cent. China has currently the largest number of people aged 80 years or over (11.5 million), followed by the United States of America (9.2 million), India (6.1 million), Japan (4.8 million), Germany (3.0 million) and the Russian Federation (3.0 million). Together, these countries account for 54 per cent of today's oldest old.

In 2050, 19 countries or areas are projected to have at least 10 per cent of their population aged 80 years or over: Austria, Belgium, Channel Islands, Finland, France, Germany, Greece, Hong Kong (SAR of China), Italy, Japan, Macao (SAR of China), the Netherlands, Norway,

TABLE 8. AVERAGE ANNUAL GROWTH RATES OF THE TOTAL POPULATION AND THE POPULATION IN BROAD AGE GROUPS, BY MAJOR AREA, 2000-2050 (MEDIUM VARIANT)  
(percentage)

Major area	Age group				Total population
	0-14	15-59	60+	80+	
World .....	0.15	0.79	2.35	3.40	0.86
More developed regions .....	-0.34	-0.42	1.07	2.23	-0.02
Less developed regions .....	0.21	1.01	2.87	4.22	1.03
Least developed countries .....	1.26	2.38	3.37	4.07	2.04
Africa .....	1.01	2.18	3.26	4.06	1.85
Asia .....	-0.09	0.68	2.67	4.08	0.78
Europe.....	-0.82	-0.84	0.81	2.06	-0.37
Northern America .....	0.35	0.39	1.70	2.41	0.66
Latin America and Caribbean .....	-0.03	0.78	2.96	3.95	0.88
Oceania .....	0.33	0.74	1.98	2.75	0.87

Source: United Nations Population Division.

Singapore, Slovenia, Spain, Sweden, Switzerland, United Kingdom. Furthermore, six countries will have more than 10 million people aged 80 years or over: China (99 million), India (48 million), the United States of America (30 million), Japan (17 million), Brazil (10 million) and Indonesia (10 million). Together they will account for 57 per cent of all the oldest old people in the world.

The number of persons in older ages declines rapidly as age increases. Octogenarians outnumber nonagenarians by a wide margin, and the proportion of centenarians among the oldest old is small. It is estimated that in 2000 about 88 per cent (61 million) of the 69 million persons aged 80 or over were octogenarians (aged 80 to 89) and about 12 per cent (8 million) were nonagenarians (aged 90 to 99). The proportion of centenarians among the oldest old was small, 0.3 per cent or 180,000.

The number of octogenarians is projected to increase to 314 million in 2050, 5.2 times the number in 2000, whereas the number of nonagenarians will reach 61 million, an eight-fold increase. But the number of people aged one hundred years or over will grow the fastest, so that by 2050 it will be eighteen times as large as in 2000.

Although the proportion of people who survive past their 100th birthday is small, their number is not negligible. In 2000 there were an estimated 180,000 centenarians in the world and by 2050 they are projected to number 3.2 million. Japan will have the highest proportion of centenarians in 2050 (nearly 1 per cent of the population). It will be followed by Finland, France, Singapore, Sweden, and Switzerland, where centenarians are projected to account for 0.2 per cent of the population of each country. In 2050, the largest centenarian populations will be in Japan (959,000), the United States of America (473,000), China (471,000) and India (142,000).

## ASSUMPTIONS UNDERLYING THE 2000 REVISION

The *2000 Revision* includes six projection variants. Four differ among themselves with respect to the assumptions made regarding the future course of fertility. The fifth differs with respect to the assumptions made about the future course of mortality and the sixth differs with respect to the future course of migration.

To describe the different projection variants, the various assumptions made regarding fertility, mortality and international migration are described first.

### A. Fertility assumptions

Fertility assumptions are described in terms of the following groups of countries:

1. *High-fertility countries*: Countries that until 2000 have had no fertility reduction or only an incipient decline;
2. *Medium-fertility countries*: Countries where fertility has been declining but whose level is still above replacement level (2.1 children per woman);
3. *Low-fertility countries*: Those with fertility at or below replacement level (2.1 children per woman) plus a few with levels very close to replacement level that are judged ready to drop below replacement level in the near future.

#### *Medium-fertility assumption:*

1. Fertility in high-fertility countries is generally assumed to decline at an average pace of nearly 1 child per decade starting in 2005 or later. Consequently, some of these countries do not reach replacement level by 2050.
2. Fertility in medium-fertility countries is assumed to reach replacement level before 2050.
3. Fertility in low-fertility countries is generally assumed to remain below the replacement level during most of the projection period, reaching by 2045-2050 the fertility of the cohort of women born in the early 1960s or, if that information is lacking, reaching 1.7 children per woman if current fertility is below 1.5 children per woman or 1.9 children per woman if current fertility is equal or higher than 1.5 children per woman.

#### *High-fertility assumption:*

1. Fertility in high and medium-fertility countries remains above the fertility in the medium-fertility assumption and eventually reaches a value 0.5 children above that reached by the medium-fertility assumption in 2045-2050.
2. For low-fertility countries, the value eventually reached is 0.4 children per woman above that reached by the medium-fertility assumption in 2045-2050.

***Low-fertility assumption:***

1. Fertility in high and medium-fertility countries remains below the fertility in the medium-fertility assumption and eventually reaches a value 0.5 children below that reached by the medium-fertility assumption in 2045-2050.
2. For low-fertility countries, the value eventually reached is 0.4 children per woman below that reached by the medium-fertility assumption in 2045-2050.

***Constant-fertility assumption:***

For each country, fertility remains constant at the level estimated for 1995-2000.

## **B. Mortality assumptions**

***Normal-mortality assumption:***

Mortality is projected on the basis of the models of change of life expectancy produced by the United Nations. In countries highly affected by the HIV/AIDS epidemic, estimates of the impact of the disease are made explicitly through assumptions about the future course of the infection, that is, by projecting the yearly incidence of HIV infection.

***Constant-mortality assumption:***

For each country, mortality remains constant at the level estimated in 1995-2000.

## **C. International migration assumptions**

***Normal-migration assumption:***

The future path of international migration is set on the basis of past international migration estimates and an assessment of the policy stance of countries with regard to future international migration flows.

***Zero-migration assumption:***

For each country, international migration is set to zero for the period 2000-2050.

Table 9 presents in a schematic way the different assumptions underlying the six projection variants. As indicated by the table, the four fertility variants (low, medium, high and constant-fertility) share the same assumptions regarding mortality and international migration. They differ among themselves only with respect to the assumptions regarding fertility. A comparison of their results allows therefore an assessment of the effects that different fertility paths have on other demographic parameters.

In addition to the four fertility variants, a constant-mortality variant and a zero-migration variant have also been prepared. They both have the same fertility assumption (i.e. the medium-

TABLE 9. PROJECTION VARIANTS IN TERMS OF ASSUMPTIONS FOR FERTILITY, MORTALITY AND INTERNATIONAL MIGRATION

<i>Projection variants</i>	<i>Assumptions</i>		
	<i>Fertility</i>	<i>Mortality</i>	<i>International migration</i>
<b>Low variant</b>	Low-fertility	Normal-mortality	Normal-migration
<b>Medium variant</b>	Medium-fertility	Normal-mortality	Normal-migration
<b>High variant</b>	High-fertility	Normal-mortality	Normal-migration
<b>Constant-fertility variant</b>	Constant-fertility	Normal-mortality	Normal-migration
<b>Constant-mortality variant</b>	Medium-fertility	Constant-mortality	Normal-migration
<b>Zero-migration variant</b>	Medium-fertility	Normal-mortality	Zero-migration

*Source:* United Nations Population Division.

fertility assumption). Furthermore, the constant-mortality variant has the same international migration assumption as the medium variant. Consequently, the results of the constant-mortality variant can be compared with those of the medium variant to assess the effect that changing mortality has on other demographic parameters. Similarly, the zero-migration variant differs from the medium variant only with respect to the underlying assumption regarding migration. Therefore, the zero-migration variant allows an assessment of the effect that non-zero migration has on other demographic parameters.

#### *Summary of the methodological changes made for the 2000 Revision*

The following points highlight some of the changes and adjustments made in the *2000 Revision* in relation to procedures followed in the *1998 Revision*:

1. High-fertility countries do not necessarily reach replacement level fertility by 2050.
2. For a greater number of countries, net international migration is assumed to be non-zero over the entire fifty-year projection period.
3. A more systematic analysis of available data on international migration was undertaken in order to produce estimates of past flows and assess the prospects for the future of international migration at the country level. Emphasis was put on the analysis of data sources having information on both the origin and destination of international migrants including, in particular, the historical database on refugee stocks produced by UNHCR.
4. The estimation and projection of the impact of HIV/AIDS was modified to take better account of population dynamics and the feed-back mechanisms related to the epidemic. Assumptions about the future course of the epidemic were made on the basis of incidence taking into account the size of the susceptible population.
5. Two projection variants have been added for comparative purposes in order to assess the impact of non-zero net international migration and declining mortality on population growth and ageing.

## **OBTAINING DATA FROM WORLD POPULATION PROSPECTS: THE 2000 REVISION**

The results of the *2000 Revision* will be issued in the form of a wall chart entitled *World Population 2000* and in a series of publications entitled *World Population Prospects: The 2000 Revision* that will consist of three volumes: Volume I: *Comprehensive Tables*, Volume II: *The Sex and Age Distribution of the World Population*, and Volume III: *Analytical Report*. The wall chart and the first two volumes (in working paper format) will be issued by mid-2001.

Highlights from the *2000 Revision* have been posted on the Population Division's web site ([www.un.org/esa/population/unpop.htm](http://www.un.org/esa/population/unpop.htm)). In addition, the data of the *2000 Revision* are available in digital form. The list of data sets produced in digital form and an order form for their purchase are posted on the Population Division's web site.

## **ANNEX TABLES**

