Economic & Social Affairs

World Population Prospects

The 2006 Revision
Volume III: Analytical Report

United Nations

ST/ESA/SER.A/263

Department of Economic and Social Affairs
Population Division

World Population Prospects

The 2006 Revision

Volume III: Analytical Report

United Nations
New York, 2010

DESA

The Department of Economic and Social Affairs of the United Nations Secretariat is a vital interface between global policies in the economic, social and environmental spheres and national action. The Department works in three main interlinked areas: (i) it compiles, generates and analyses a wide range of economic, social and environmental data and information on which Member States of the United Nations draw to review common problems and take stock of policy options; (ii) it facilitates the negotiations of Member States in many intergovernmental bodies on joint courses of action to address ongoing or emerging global challenges; and (iii) it advises interested Governments on the ways and means of translating policy frameworks developed in United Nations conferences and summits into programmes at the country level and, through technical assistance, helps build national capacities.

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.

Symbols of United Nations documents are composed of capital letters combined with figures.

This publication has been issued without formal editing.

Suggested citation:

United Nations, Department of Economic and Social Affairs, Population Division (2010). *World Population Prospects: The 2006 Revision,* vol. III: *Analytical Report* (United Nations publication, Sales No. E.07.XIII.4).

ST/ESA/SER.A/263
ISBN 978-92-1-151431-5

UNITED NATIONS PUBLICATION
Sales No. E.07.XIII.4

PREFACE

The *2006 Revision* of *World Population Prospects* presents the global demographic estimates and projections prepared by the Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat in 2006. This volume of the *2006 Revision* of *World Population Prospects* combines analysis and documentation. It provides a comprehensive overview about current and long-term trends of population size and its composition and contains a description of the methodologies, assumptions and data sources underpining the *2006 Revision*.

The full results of the *2006 Revision* are presented in a series of three volumes. In addition to the present volume, the first volume[1] provides the comprehensive tables displaying demographic profiles and major demographic indicators for each development group, major area, region and country for 1950-2050 and the second volume contains the age and sex distributions of populations for the period 1950-2050[2]. Summary findings of the *2006 Revision* are also shown in a wall chart[3]. In addition, data are distributed in digital form. Interested users can purchase one of two different CD-ROMs[4] containing the major results of the *2006 Revision*.

Responsibility for the *2006 Revision* rests with the Population Division. Preparation of the *2006 Revision* was facilitated by the collaboration of the regional commissions, especially the Economic Commission for Latin America and the Caribbean, and of UNAIDS, the specialized agencies and other relevant bodies of the United Nations with the Population Division.

A major source of official national population statistics used in the preparation of these estimates and projections is the *United Nations Demographic Yearbook* and its accompanying databases, produced and maintained by the Statistics Division of the Department of Economic and Social Affairs of the United Nations Secretariat. The Population Division is grateful to the Statistics Division for its continuing cooperation.

For further information about the *2006 Revision*, please contact Ms. Hania Zlotnik, Director, Population Division, Department of Economic and Social Affairs, United Nations, New York, NY 10017, USA (fax: 1-212-963-2147).

---

[1] *World Population Prospects: The 2006 Revision, vol. I: Comprehensive Tables* (United Nations publication, Sales No. E.07.XIII.2).

[2] *World Population Prospects: The 2006 Revision, vol. II: Sex and Age Distribution of the World Population* (United Nations publication, Sales No. E.07.XIII.3).

[3] *World Population Prospects: The 2006 Revision, Wall Chart* (United Nations publication, Sales No. E.08.XIII.3).

[4] *World Population Prospects: The 2006 Revision, CD-ROM Edition* (United Nations publication, Comprehensive Dataset, Sales No. E.07.XIII.8; Extended Dataset, Sales No. E.07.XIII.7).

CONTENTS

TABLES

FIGURES

BOXES

Explanatory notes

The following symbols have been used in the tables throughout this report:

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

References to countries, territories and areas:

The designations employed and the material in this publication 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 or area or its authorities, or concerning the delimitation of its frontiers or boundaries.

The designation “more developed” and “less developed” regions are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. The term “country” as used in this publication also refers, as appropriate, to territories or areas.

More developed regions comprise all regions of Europe plus Northern America, Australia/New Zealand and Japan.

Less developed regions comprise all regions of Africa, Asia (excluding Japan) and Latin America and the Caribbean, as well as Melanesia, Micronesia and Polynesia.

The group of least developed countries at the time this Revision was prepared comprised 50 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, São Tomé and Príncipe, Senegal, Sierra Leone, Solomon Islands, Somalia, Sudan, Timor-Leste, Togo, Tuvalu, Uganda, United Republic of Tanzania, Vanuatu, Yemen and Zambia.

Other less developed countries comprise the less developed regions excluding the least developed countries.

The designation sub-Saharan Africa is commonly used to indicate all of Africa except northern Africa, with the Sudan included in sub-Saharan Africa.

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.

Names and compositions of geographical areas follow those of “Standard country or area codes for statistical use” (ST/ESA/STAT/SER.M/49/Rev.3), available at http://unstats.un.org/unsd/methods/m49/m49.htm.

The following abbreviations have been used:

AIDS	Acquired immunodeficiency syndrome
ART	Antiretroviral therapy
DESA	Department of Economic and Social Affairs
HIV	Human immunodeficiency virus
MDGs	Millennium Development Goals
SAR	Special Administrative Region
UNAIDS	Joint United Nations Programme on HIV/AIDS

For analytical purposes, the following country groupings have been used:

CLASSIFICATION OF COUNTRIES BY MAJOR AREA AND REGION OF THE WORLD

Africa

Eastern Africa

Burundi
Comoros[1]
Djibouti
Eritrea
Ethiopia
Kenya
Madagascar
Malawi
Mauritius[2]
Mozambique
Réunion
Rwanda
Seychelles*
Somalia
Uganda
United Republic of Tanzania
Zambia
Zimbabwe

Middle Africa

Angola
Cameroon
Central African Republic
Chad
Congo
Democratic Republic of the Congo
Equatorial Guinea
Gabon
São Tomé and Príncipe

Northern Africa

Algeria
Egypt
Libyan Arab Jamahiriya
Morocco
Sudan
Tunisia
Western Sahara

Southern Africa

Botswana
Lesotho
Namibia
South Africa
Swaziland

Western Africa

Benin
Burkina Faso
Cape Verde
Côte d'Ivoire
Gambia
Ghana
Guinea
Guinea-Bissau
Liberia
Mali
Mauritania
Niger
Nigeria
Saint Helena[3] *
Senegal
Sierra Leone
Togo

Asia

Eastern Asia

China
China, Hong Kong SAR[5]
China, Macao SAR[6]
Democratic People's Republic of Korea
Japan
Mongolia
Republic of Korea

South-Central Asia[4]

Afghanistan
Bangladesh
Bhutan
India
Iran (Islamic Republic of)
Kazakhstan
Kyrgyzstan
Maldives
Nepal
Pakistan
Sri Lanka
Tajikistan
Turkmenistan
Uzbekistan

South-Eastern Asia

Brunei Darussalam
Cambodia
Indonesia
Lao People's Democratic Republic
Malaysia
Myanmar
Philippines
Singapore
Thailand
Timor-Leste
Viet Nam

Western Asia

Armenia
Azerbaijan
Bahrain
Cyprus
Georgia
Iraq
Israel
Jordan
Kuwait
Lebanon
Occupied Palestinian Territory
Oman
Qatar
Saudi Arabia
Syrian Arab Republic
Turkey
United Arab Emirates
Yemen

[1] Including Mayotte.
[2] Including Agalega, Rodrigues and Saint Brandon.
[3] Including Ascension and Tristan da Cunha.
[4] The regions Southern Asia and Central Asia are combined into South-Central Asia.
[5] As of 1 July 1997, Hong Kong became a Special Administrative Region (SAR) of China.
[6] As of 20 December 1999, Macao became a Special Administrative Region (SAR) of China

Europe

Eastern Europe

Belarus
Bulgaria
Czech Republic
Hungary
Moldova
Poland
Romania
Russian Federation
Slovakia
Ukraine

Northern Europe

Channel Islands[7]
Denmark
Estonia
Faeroe Islands*
Finland[8]
Iceland
Ireland
Isle of Man*
Latvia
Lithuania
Norway[9]
Sweden
United Kingdom of Great Britain and Northern Ireland[10]

Southern Europe

Albania
Andorra*
Bosnia and Herzegovina
Croatia
Gibraltar*
Greece
Holy See*
Italy
Malta
Montenegro
Portugal
San Marino*
Serbia
Slovenia
Spain
The former Yugoslav Republic of Macedonia[11]

Western Europe

Austria
Belgium
France
Germany
Liechtenstein*
Luxembourg
Monaco*
Netherlands
Switzerland

Latin America and the Caribbean

Caribbean

Anguilla
Antigua and Barbuda*
Aruba
Bahamas
Barbados
British Virgin Islands*
Cayman Islands*
Cuba
Dominica*
Dominican Republic
Grenada
Guadeloupe
Haiti
Jamaica
Martinique
Montserrat*
Netherlands Antilles
Puerto Rico
Saint Kitts and Nevis*
Saint Lucia
Saint Vincent and the Grenadines
Trinidad and Tobago
Turks and Caicos Islands*
United States Virgin Islands

Central America

Belize
Costa Rica
El Salvador
Guatemala
Honduras
Mexico
Nicaragua
Panama

South America

Argentina
The Plurinational State of Bolivia
Brazil
Chile
Colombia
Ecuador
Falkland Islands (Malvinas)*
French Guiana
Guyana
Paraguay
Peru
Suriname
Uruguay
Venezuela (Bolivarian Republic of)

[7] Refers to Guernsey and Jersey.
[8] Including Åland Islands.
[9] Including Svalbard and Jan Mayen Islands.
[10] Also referred to as United Kingdom.
[11] Also referred to as TFYR Macedonia.

Northern America

Bermuda*
Canada
Greenland*
Saint Pierre and Miquelon*
United States of America[12]

Oceania

Australia/New Zealand

Australia[13]
New Zealand

Melanesia

Fiji
New Caledonia
Papua New Guinea
Solomon Islands
Vanuatu

Micronesia

Guam
Kiribati*
Marshall Islands*
Micronesia (Federated States of)
Nauru*
Northern Mariana Islands*
Palau*

Polynesia

American Samoa*
Cook Islands*
French Polynesia
Niue*
Pitcairn*
Samoa
Tokelau*
Tonga
Tuvalu*
Wallis and Futuna Islands*

Sub-Saharan Africa

Angola
Benin
Botswana
Burkina Faso
Burundi
Cameroon
Cape Verde
Central African
Chad
Comoros
Congo
Côte d'Ivoire
Democratic Republic of the Congo
Djibouti
Equatorial Guinea
Eritrea
Ethiopia
Gabon
Gambia
Ghana
Guinea
Guinea-Bissau
Kenya
Lesotho
Liberia
Madagascar
Malawi
Mali
Mauritania
Mauritius
Mozambique
Namibia
Niger
Nigeria
Réunion
Rwanda
Saint Helena
São Tomé and Príncipe
Senegal
Seychelles
Sierra Leone
Somalia
South Africa
Sudan
Swaziland
Togo
Uganda
United Republic of Tanzania
Zambia
Zimbabwe

[12] Also referred to as United States.
[13] Including Christmas Island, Cocos (Keeling) Islands and Norfolk Island.

Least developed 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
São Tomé and Príncipe
Senegal
Sierra Leone
Solomon Islands
Somalia
Sudan
Timor-Leste
Togo
Tuvalu
Uganda
United Republic of Tanzania
Vanuatu
Yemen
Zambia

Note: Countries with a population of less than 100,000 in 2007 are indicated by an asterisk (*).

INTRODUCTION

Timely and accurate information about population trends continues to be in high demand. Knowledge about the current size and structure of a country's population is needed for the formulation and implementation of policies and programmes in almost all areas of public life. Because policies are aimed at achieving goals in the future, knowledge about future population trends is required. What is true for individual countries also holds for the international community. United Nations activities in areas as diverse as health and environment, poverty reduction and promoting social progress and economic growth, rely on comprehensive and consistent demographic information. The population estimates and projections prepared by the Population Division of the United Nations Department of Economic and Social Affairs (DESA) provide that information.

The Population Division has been preparing the official United Nations estimates and projections of the world's population since 1951. The *2006 Revision* of *World Population Prospects* is the twentieth set of global estimates and projections completed by the Population Division since that date. Until 1978, revisions of the global set of population projections were published every five years, but since that date the Population Division has issued revisions of the estimates and projections for all countries and areas of the world every two years.

The data produced for each revision of *World Population Prospects* represent a unique set of comprehensive, consistent and internationally comparable estimates and projections of population by age and sex as well as estimates and projections of mortality and fertility schedules by age and sex and estimates of net international migration for each country. Such data serve as a basis for the calculation of sectoral estimates and projections produced by the various agencies and bodies of the United Nations system. Given the numerous uses of the Population Division's estimates and projections as well as the fact that future world population trends are inherently uncertain, it is important to ensure that the official set of population estimates and projections of the United Nations system are kept as up-to-date as possible. This goal is met by revising the official set of projections every two years and, in the process, incorporating the most recent demographic information available for each country of the world.

The results of the *2006 Revision* are published in three volumes. Volume I presents all major demographic indicators, for all countries and their aggregates, in the form of demographic profiles and indicator-specific data tables. Volume II presents detailed information about the composition of populations by age and sex. This third volume is devoted to an analysis of the results, the methodological underpinnings and the documentation of the data sources of the *2006 Revision*. In addition, the results of the *2006 Revision* are available in digital form on two CD-ROMs, as well as on the Population Division's website at *http://www.unpopulation.org.* A wall chart showing population estimates and projections for 2007, 2020 and 2050 for all countries of the world and corresponding demographic indicators has also been issued.

The *2006 Revision* provides estimates and projections for 229 countries. For 195 countries of the world that had an estimated population of 100,000 inhabitants or more in the year 2007, the projections are carried out using the cohort-component method, which requires explicit assumptions on future fertility, mortality and migration trends for each country. For 34 countries that in 2007 had less than 100,000 inhabitants, projections of the total population are made on the basis of assumptions about the future rate of population growth. Such methodology does not require or produce information on future fertility, mortality and migration levels.

Estimates and projections are made and presented for each country separately. The estimates cover the period 1950-2005 and the projections cover the period 2005-2050. Results are also presented for the world as a whole, its twenty-one regions and six major areas. In addition, countries are organized by level of development. The sets of countries that constitute each region, major area and development group are shown in the explanatory notes.

The *2006 Revision* includes eight projection variants and three AIDS scenarios. The eight variants are: low, medium, high, constant-fertility, instant-replacement-fertility, constant-mortality, no change (constant fertility and constant mortality) and zero-migration. The first five variants, namely, the low, medium, high, constant-fertility and instant-replacement-fertility, differ among themselves exclusively in the assumptions made regarding the future path of fertility. The sixth variant, named "constant-mortality", differs from the medium variant only with regard to the path followed by future mortality. The seventh variant, denominated "no change", has constant mortality and constant fertility and thus differs from the medium variant with respect to both fertility and mortality. The eight variant, denominated "zero-migration", differs from the medium variant only with regard to the path followed by future international migration. Generally, variants differ from each other only over the period 2005-2050. The low, medium and high variants constitute the core of the official projections. They encompass the likely future path of population growth for each country of the world. The low and high variants provide lower and upper bounds for that growth. The medium variant is a useful central reference for trends over the longer term. The constant-fertility, instant-replacement-fertility, constant-mortality, no change and zero-migration variants have been produced for illustrative purposes, to permit an assessment of the effects that future assumptions on fertility, mortality and international migration in the medium variant have in relation to these scenarios.

In addition, the *2006 Revision* includes three AIDS scenarios named No-AIDS, high-AIDS and AIDS-vaccine. These scenarios are variations of the medium variant and differ from each other and from the medium variant in terms of the path mortality follows because they each incorporate different assumptions regarding the course of the HIV/AIDS epidemic. Note that only 62 countries are considered to be significantly affected by the epidemic. Consequently, the AIDS scenarios produce different projections only for those countries.

The No-AIDS scenario applies the mortality likely to be exhibited by the non-infected population to the whole population, thus excluding the direct impacts of the epidemic. The high-AIDS scenario assumes that the AIDS modeling parameters determining the path of the HIV/AIDS epidemic remain constant at their 2005 level. The AIDS-vaccine scenario assumes that there are no new HIV infections starting in 2010.

The estimates associated with the No-AIDS scenario (that is, the figures for 1980-2005) differ from the estimates of the other variants because AIDS started affecting the populations in the majority of the highly-affected countries around 1980. By comparing these results with those of the estimates and medium variant that include explicitly the effects of the HIV/AIDS epidemic, the user can infer the impact of the epidemic. The two other AIDS scenarios (high-AIDS and AIDS-vaccine) provide alternative bounds on the possible course of the epidemic.

Volumes I, II and III present results for the three main variants, medium, high and low. Additionally, projection results from the constant-fertility variant are shown in volume I. The results of the four additional variants, instant-replacement, constant-mortality, no change, zero-migration and the three special HIV/AIDS scenarios are not included in the volumes. However, the results of these additional variants and scenarios are contained in the CD-ROMs entitled "Comprehensive" and "Extended" (see order form, chapter VIII).

This third volume of the *2006 Revision World Population Prospects* combines analysis and documentation. It provides, in it first five chapters, a comprehensive overview about current settings and long-term trends of population size and its composition (chapters I and II), fertility (chapter III), mortality (chapter IV) and international migration (chapter V). The next two chapters present a description of the methodologies used and the assumptions made for the preparation of the *2006 Revision* (chapter VI) and documentation of country-specific data sources and estimation methods (chapter VII). The final chapter contains information about and a form for ordering the data from the *2006 Revision* on CD-ROM (chapter VIII).

I. POPULATION SIZE AND CHANGE

The human footprint on the planet is getting heavier. At 6.5 billion people in 2005, the planet now supports 47.9 persons per sq. km. In the preceding decade, 796 million people were added to world population. In the following decade, almost as many as 780 million will be added. By 2025, world population is projected to reach 8.0 billion and by 2050, 9.2 billion (table I.1). By then, the planet will support 67.5 persons per sq. km. (figure I.1), assuming no new land is created—and no land is lost to the seas.

Substantial population growth is continuing despite widely reported declines in fertility in less developed regions, the main driver of population growth now and for decades to come. These fertility declines, to be considered in a later chapter, are slowing the momentum of population growth but will not stop it for decades—in fact, in the projections to be described, not within the first half of this century.

This chapter considers the magnitude and rate of growth to 2050 for the world, regions and some notable countries[1] and the way population is distributed and will be redistributed over time across the planet. How this population will change, specifically how it will age, is the focus of the next chapter. Then the report takes up the reasons for changes in growth and distribution in world and country populations: the driving factors of fertility, mortality and international migration. Some attention is paid to alternative scenarios that could produce higher or lower population growth.

This report presents illustrative rather than detailed country statistics. The latter can be obtained in printed form, online, or on a CD-ROM from the United Nations Population Division.

A. POPULATION GROWTH

Projected increases in world population may appear moderate from the perspective of the past but will be large in absolute terms. They will also be uneven across the globe, with some areas growing much faster and a few others potentially shrinking (table I.1).

World population growth exceeded 2.0 per cent annually in 1965-1970 and has been falling since then, to 1.2 per cent in 2000-2005. Rates are projected to fall further, so that after 2020 growth will be less than 1.0 per cent a year and after 2040 less than 0.5 per cent a year. The number of people added to world population each year peaked two decades later than growth rates, in the late 1980s, at about 88 million and is now at 78 million. As far forward as 2050, the annual increment, though reduced further, will still be positive at slightly above 30 million (figure I.2 and table I.2).

If the declining rates appear to suggest that growth is steadily being contained, it is worth considering what the absolute numbers imply. At an increment of 78 million, the world has been adding every year slightly less than the 2005 population of Germany or roughly the equivalent of the 2005 population of Ethiopia and will continue to do so till around 2015. This annual increment is also about as large as the 1975 population of Bangladesh. By 2050, when annual increments are close to 30 million, they will be roughly the size of the 2005 populations of Kenya or Canada. By 2050, as figure I.3 illustrates, world population will be larger than it was in 2005 by five times equivalent of the combination of Germany, Ethiopia, Turkey, Iran, France, Italy, South Africa, Argentina and Kenya. It will be a different world.

[1] Covered are 195 countries or territories (the term "country" is used for both) with populations of at least 100,000 in 2007. These include 99.98 per cent of world population. Aggregate estimates include smaller countries and territories.

TABLE I.1. POPULATION FOR THE WORLD AND FOUR DEVELOPMENT GROUPS, ESTIMATED FOR 1950-2005 AND PROJECTED, WITH THREE VARIANTS, FOR 2005-2050

(millions)

Year	*World*	*More developed regions*	*Less developed regions*	*Least developed countries*	*Other less developed countries*
Estimates and medium variant					
1950	2 535	814	1 722	200	1 521
1955	2 771	864	1 907	221	1 685
1960	3 032	916	2 116	247	1 869
1965	3 343	967	2 376	278	2 097
1970	3 699	1 008	2 690	316	2 374
1975	4 076	1 048	3 028	358	2 670
1980	4 451	1 083	3 368	406	2 962
1985	4 855	1 115	3 740	461	3 279
1990	5 295	1 149	4 146	525	3 620
1995	5 719	1 175	4 544	601	3 943
2000	6 124	1 194	4 930	679	4 250
2005	6 515	1 216	5 299	767	4 532
2010	6 907	1 232	5 674	863	4 811
2015	7 295	1 245	6 050	967	5 083
2020	7 667	1 254	6 413	1 075	5 338
2025	8 011	1 259	6 752	1 187	5 565
2030	8 318	1 261	7 057	1 301	5 756
2035	8 587	1 260	7 327	1 415	5 912
2040	8 824	1 257	7 567	1 527	6 039
2045	9 026	1 252	7 774	1 637	6 137
2050	9 191	1 245	7 946	1 742	6 204
High variant					
2010	6 967	1 243	5 725	870	4 855
2015	7 459	1 272	6 188	985	5 202
2020	7 966	1 300	6 667	1 111	5 555
2025	8 451	1 323	7 127	1 244	5 883
2030	8 914	1 345	7 569	1 383	6 186
2035	9 368	1 367	8 001	1 529	6 472
2040	9 830	1 393	8 437	1 682	6 755
2045	10 297	1 421	8 876	1 841	7 035
2050	10 756	1 451	9 306	2 002	7 304
Low variant					
2010	6 844	1 222	5 622	856	4 766
2015	7 127	1 218	5 909	946	4 963
2020	7 364	1 208	6 156	1 035	5 121
2025	7 569	1 194	6 375	1 126	5 249
2030	7 727	1 177	6 550	1 214	5 336
2035	7 829	1 156	6 673	1 297	5 376
2040	7 872	1 130	6 742	1 372	5 369
2045	7 858	1 099	6 759	1 439	5 320
2050	7 792	1 065	6 727	1 496	5 231

Figure I.1. World population and density, estimated every five years for 1950-2005 and projected to 2050

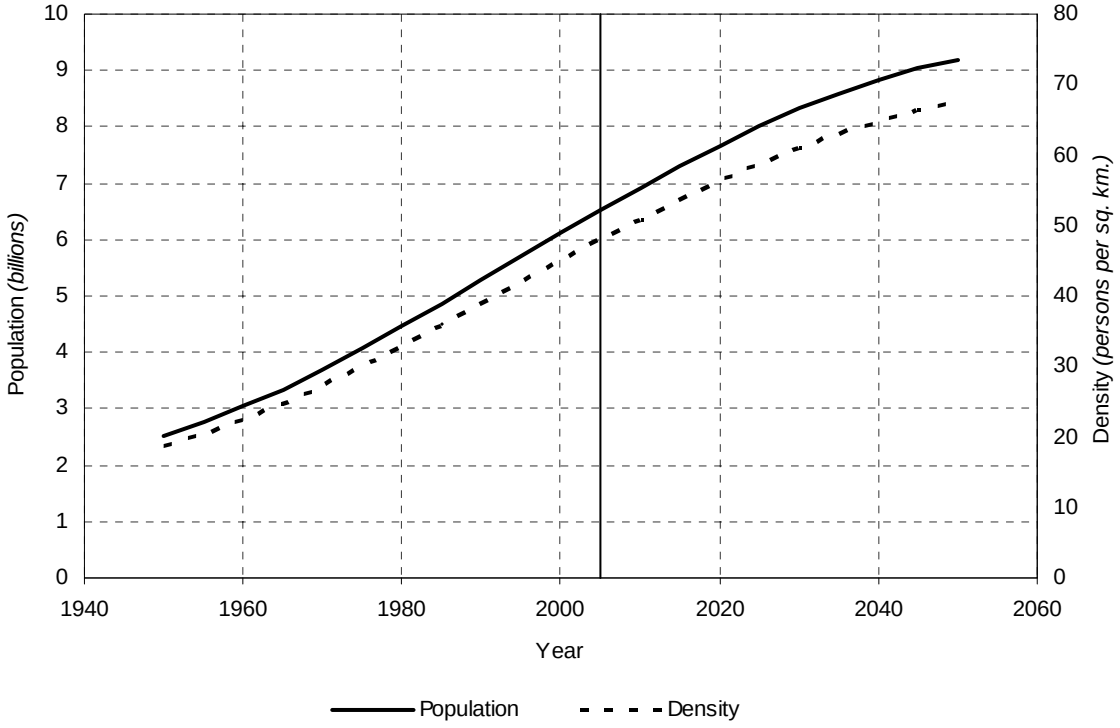


Figure I.2. World annual population growth rate and annual increment, estimated for every five years for 1950-2005 and projected to 2050

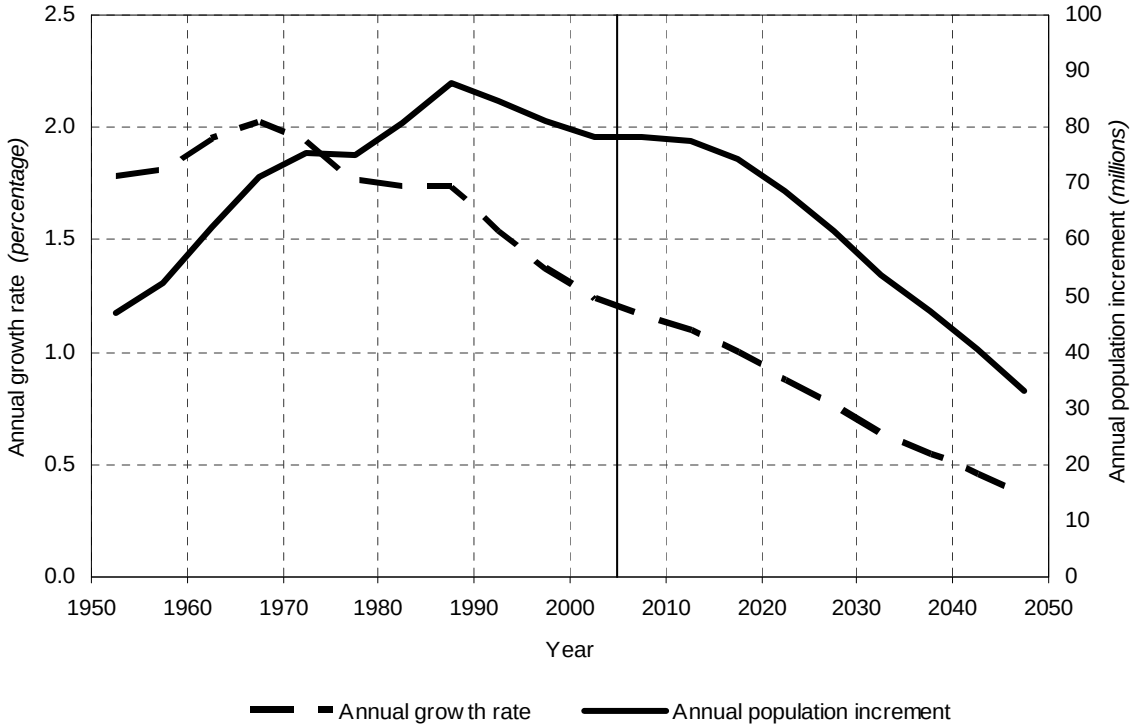
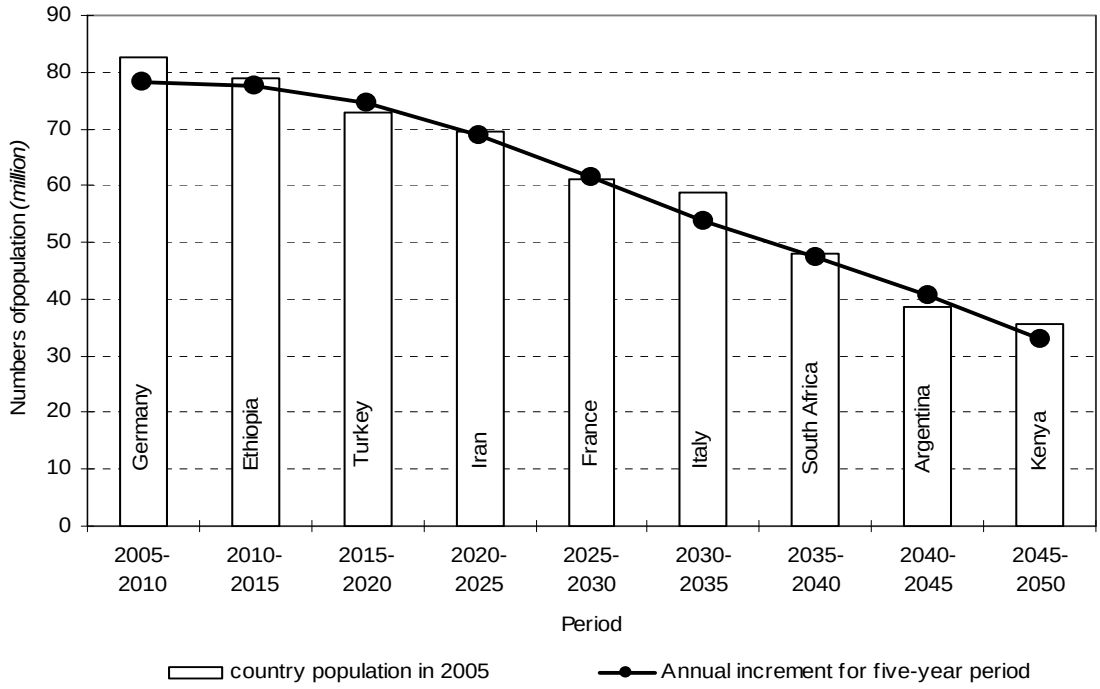


TABLE I.2. ANNUAL POPULATION INCREMENT AND ANNUAL GROWTH RATE FOR THE WORLD AND FOUR DEVELOPMENT GROUPS, 1950-2050
(medium variant)

	Average annual increment (millions)					*Average annual growth rate (percentage)*				
Period	*World*	*More developed regions*	*Less developed regions*	*Least developed countries*	*Other less developed countries*	*World*	*More developed regions*	*Less developed regions*	*Least developed countries*	*Other less developed countries*
1950-1955	47.1	10.1	37.0	4.2	32.8	1.78	1.20	2.04	2.00	2.05
1955-1960	52.2	10.4	41.8	5.2	36.6	1.80	1.17	2.08	2.21	2.06
1960-1965	62.2	10.2	52.0	6.2	45.8	1.95	1.08	2.32	2.37	2.31
1965-1970	71.2	8.3	62.9	7.5	55.4	2.02	0.84	2.49	2.53	2.48
1970-1975	75.5	7.9	67.6	8.5	59.1	1.94	0.77	2.37	2.52	2.35
1975-1980	75.1	7.0	68.0	9.5	58.5	1.76	0.66	2.13	2.49	2.08
1980-1985	80.8	6.4	74.3	11.0	63.3	1.74	0.58	2.09	2.55	2.03
1985-1990	87.9	6.7	81.2	12.9	68.3	1.73	0.60	2.06	2.62	1.98
1990-1995	84.8	5.3	79.6	15.1	64.4	1.54	0.45	1.83	2.69	1.71
1995-2000	81.0	3.8	77.3	15.7	61.6	1.37	0.32	1.63	2.45	1.50
2000-2005	78.1	4.3	73.8	17.5	56.4	1.24	0.36	1.44	2.42	1.28
2005-2010	78.4	3.4	75.0	19.3	55.7	1.17	0.28	1.37	2.37	1.19
2010-2015	77.7	2.5	75.2	20.7	54.5	1.10	0.20	1.28	2.26	1.10
2015-2020	74.4	1.8	72.6	21.7	50.9	1.00	0.14	1.17	2.13	0.98
2020-2025	68.7	1.0	67.7	22.4	45.3	0.88	0.08	1.03	1.98	0.83
2025-2030	61.4	0.4	61.1	22.7	38.3	0.75	0.03	0.89	1.83	0.68
2030-2035	53.9	-0.2	54.0	22.8	31.2	0.64	-0.01	0.75	1.68	0.54
2035-2040	47.3	-0.6	47.9	22.6	25.4	0.54	-0.05	0.64	1.53	0.42
2040-2045	40.5	-1.0	41.5	21.9	19.6	0.45	-0.08	0.54	1.39	0.32
2045-2050	33.1	-1.3	34.4	21.0	13.4	0.36	-0.10	0.44	1.24	0.22

Figure I.3. Annual increment in world population in five-year periods for 2005-2050 as compared to the population of selected countries in 2005



Population might in principle grow more slowly, but then it might also grow faster. Alternative scenarios for population growth were produced by assuming alternative trends in fertility, country by country. In the high scenario, growth rates are still above 1.0 per cent up to 2030 and eventually go no lower than 0.9 per cent. In the low scenario, growth rates fall immediately below 1.0 per cent and become negative after 2040 (figure I.4). Although these trends in growth rates are somewhat different, population numbers will diverge only gradually from the medium scenario. Relative to population in the medium scenario, it takes almost to 2040 for population to be 10 per cent higher in the high scenario and 10 per cent lower in the low scenario. By 2050, population in the alternative scenarios diverges about 15 per cent in each direction (figure I.5).

An additional scenario was produced with constant fertility in each country, mainly for illustrative purposes rather than as a viable alternative. This scenario has growth rates initially lower than the high scenario (because fertility below replacement level is allowed to continue in some countries), but eventually rates rise, almost reaching 1.5 per cent (figure I.4). The reason for this rise is that people living in high fertility countries become an increasingly large proportion of the total. In this scenario, population diverges somewhat more from the medium scenario, though not for a couple of decades. By 2040, population is 16 per cent above the medium scenario and by 2050, 29 per cent above (details not shown).

The great divide, where population growth is concerned, has long been between more developed and less developed regions. Beginning around 1970, however, another divide opened up, between the 50 least developed countries in the world (the majority in sub-Saharan Africa) and other less developed countries (i.e., less developed regions excluding the least developed countries). The gap between annual growth rates in less developed and more developed regions grew to 1.65 points around 1970 and has been declining since then, falling to 1.09 points by 2000-2005. The gap in growth rates between least developed countries and other less developed countries, meanwhile, has been rising, reaching 1.14 points in 2000-2005—for the first time, greater than the gap between more developed regions and all less developed countries (table I.2).

Figure I.4. Alternative growth rates for world population, 2005-2050

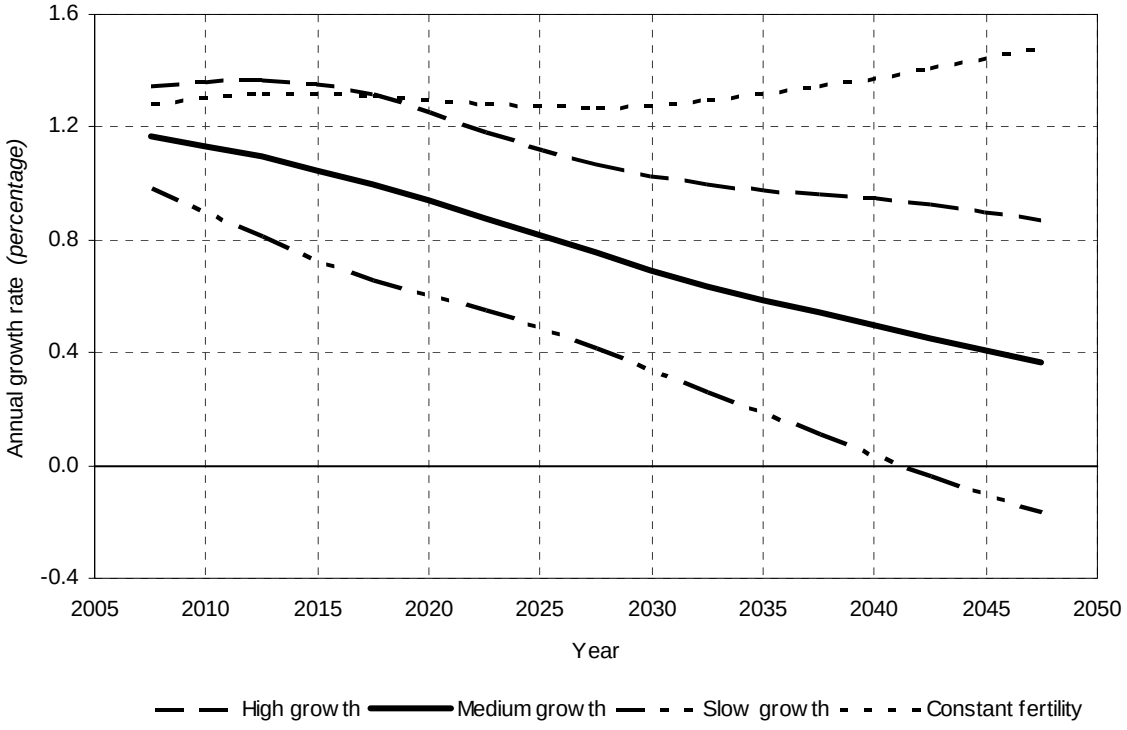
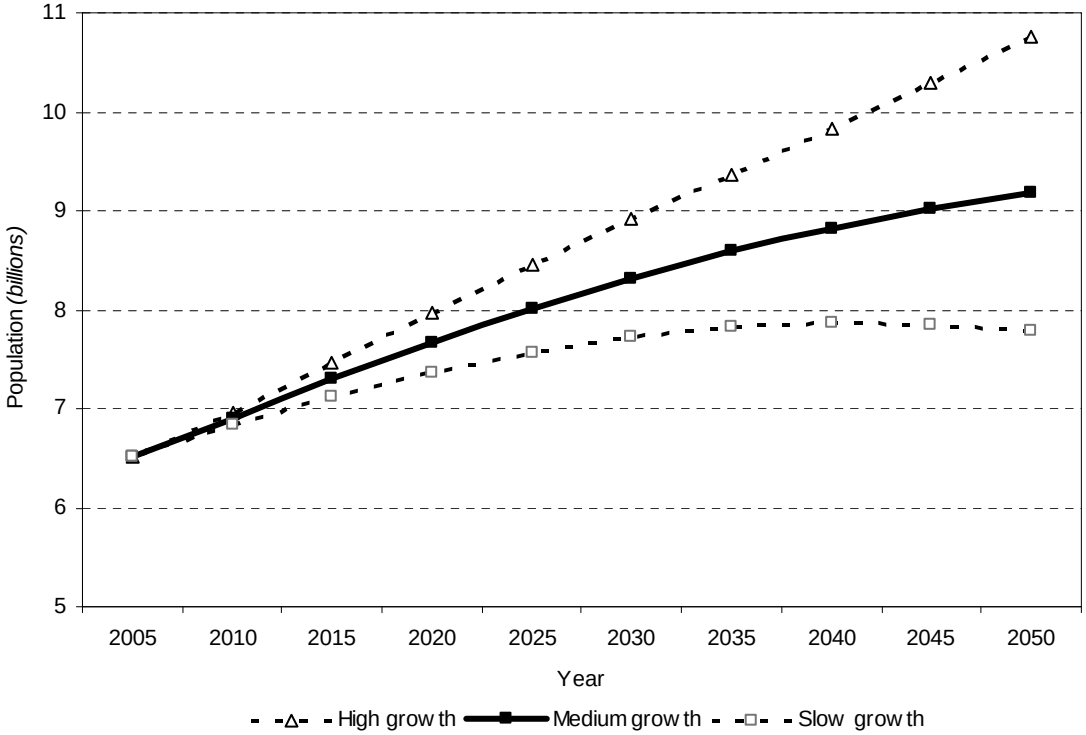


Figure I.5. Alternative scenarios for world population growth, 2005-2050

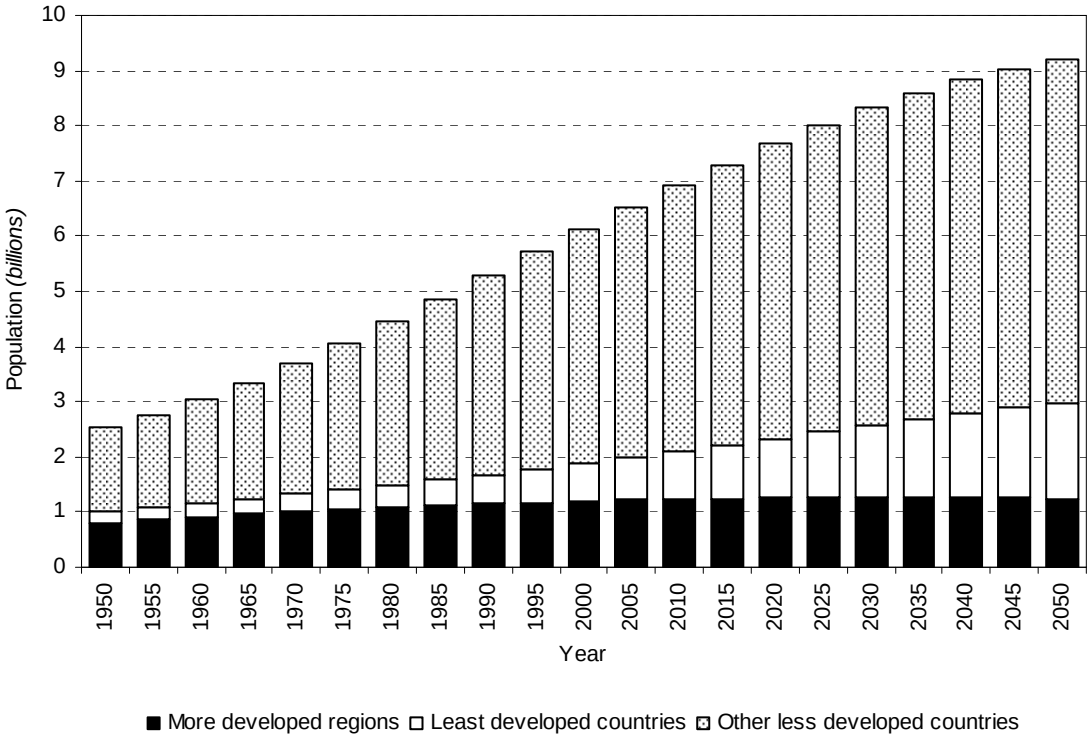


Growth rates are now projected to fall in each of these development groups of countries, though not equally fast. In more developed regions, where growth is already quite slow, a gentle decline will continue, with negative growth projected by 2030. Growth rates in the least developed countries will also decline, largely in parallel with those in other less developed countries, which means that they will see growth rates falling somewhat faster, approaching those in more developed regions but remaining higher even up to 2050 (figure I.6).

These different growth trends produce a redistribution of world population, particularly between more developed regions and the least developed countries (table I.1 and figure I.7). Back in 1950, the more developed regions, with almost a third of world population, had four times the population of the least developed countries. By 2005, the more developed regions were still larger, with 19 per cent of world population versus 12 per cent in the least developed countries. Close to 2030, they should be about equal and then growth will go in opposite directions as the population of the more developed regions shrinks. By 2050, the more developed regions will be down to 14 per cent and the least developed countries up to 19 per cent, almost exactly reversing their positions in 2005. Unlike these two development groups, less developed regions excluding the least developed countries (i.e., other less developed countries), the largest group at 70 per cent of total population in 2005, will stay about the same proportion at least up to mid-century.

Figure I.6. Annual growth rates by development group, 1950-2050

Figure I.7. Population distribution by development group, 1950-2050



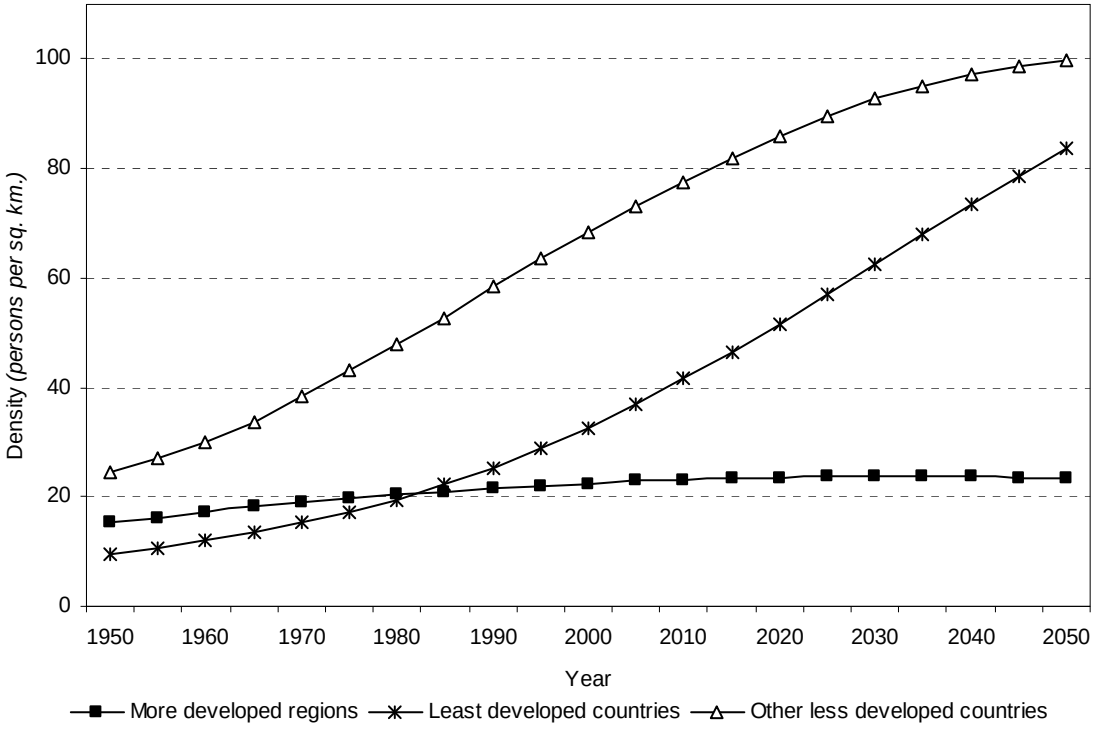
These growth trends also mean that relative population densities are changing (table I.3 and figure I.8). Worldwide in 2005 there were 48 persons per sq. km. of land, a substantial increase from 1985 (36 persons per sq. km.), 1965 (25 persons per sq. km.), or 1950 (19 persons per sq. km.). The more developed regions were below the world average in 2005 at 23 persons per sq. km. and this figure hardly changes in the projections. The least developed countries caught up with this level of population density in 1985, had a population density 50 per cent higher by 2005 and will be twice as densely populated than at present by 2040. The countries with the highest overall population densities and contributing the most to world levels, however, are the other less developed countries (i.e., less developed regions excluding the least developed countries), at 64 persons per sq. km. in 2005. Population density is rising more slowly but will stay ahead of the least developed countries in the projections.

Alternative scenarios hardly change the distribution of population across these three development groups. Each group grows faster, as one would expect, in the high scenario and slower in the low scenario. The more developed regions do not experience any population decline in the high scenario, but start to decline as early as 2010 in the low scenario. Nevertheless, because the assumptions of higher or lower fertility are applied across the board, the scenarios do not alter the trends in distribution across these groups. By 2050, the more developed regions are 14 per cent of the total in each scenario, the least developed countries 19 per cent and other less developed countries 67 per cent to 68 per cent. Population densities would naturally be higher or lower depending on the scenario, with the less developed regions excluding the least developed countries (i.e., other less developed countries) having the highest population density in the high scenario, at 118 persons per sq. km. and the more developed regions having the lowest population density in the low scenario, at 20 persons per sq. km (details not shown).

TABLE I.3. POPULATION DENSITY AND RENEWABLE FRESH WATER PER CAPITA FOR THE WORLD AND FOUR DEVELOPMENT GROUPS, 1950-2050

	Population density (persons per sq. km.)					*Renewable fresh water (cubic meters per capita)*				
Year	*World*	*More developed regions*	*Less developed regions*	*Least developed countries*	*Other less developed countries*	*World*	*More developed regions*	*Less developed regions*	*Least developed countries*	*Other less developed countries*
1950	18.6	15.3	20.8	9.6	24.5	21 539	17 914	23 253	35 928	21 584
1955	20.4	16.2	23.0	10.6	27.1	19 707	16 868	20 994	32 505	19 482
1960	22.3	17.2	25.5	11.9	30.1	18 010	15 909	18 919	29 101	17 572
1965	24.6	18.2	28.7	13.4	33.8	16 335	15 071	16 849	25 852	15 654
1970	27.2	19.0	32.4	15.2	38.2	14 763	14 452	14 880	22 785	13 828
1975	29.9	19.7	36.5	17.2	43.0	13 396	13 905	13 220	20 089	12 298
1980	32.7	20.4	40.6	19.5	47.7	12 267	13 454	11 885	17 735	11 083
1985	35.7	21.0	45.1	22.2	52.8	11 246	13 067	10 704	15 613	10 013
1990	38.9	21.6	50.0	25.3	58.3	10 313	12 683	9 656	13 696	9 069
1995	42.0	22.1	54.8	28.9	63.5	9 548	12 399	8 810	11 973	8 328
2000	45.0	22.4	59.5	32.7	68.4	8 916	12 204	8 120	10 593	7 725
2005	47.9	22.8	63.9	36.9	73.0	8 382	11 989	7 554	9 386	7 244
2010	50.7	23.2	68.4	41.5	77.5	7 906	11 825	7 055	8 336	6 825
2015	53.6	23.4	73.0	46.5	81.8	7 485	11 706	6 616	7 445	6 459
2020	56.3	23.6	77.4	51.7	85.9	7 122	11 623	6 242	6 694	6 151
2025	58.8	23.7	81.4	57.1	89.6	6 817	11 576	5 929	6 064	5 900
2030	61.1	23.7	85.1	62.5	92.7	6 565	11 560	5 672	5 534	5 704
2035	63.1	23.7	88.4	68.0	95.2	6 359	11 567	5 463	5 087	5 553
2040	64.8	23.6	91.3	73.4	97.2	6 188	11 596	5 290	4 712	5 437
2045	66.3	23.5	93.8	78.7	98.8	6 050	11 643	5 149	4 396	5 350
2050	67.5	23.4	95.8	83.7	99.9	5 941	11 704	5 038	4 132	5 292

Figure I.8. Population density by development group, 2005-2050



B. MAJOR WORLD AREAS

The description of trends in the three development groups of countries foreshadows what one sees when one focuses on major world areas (table I.4). Although Africa encompasses not only least developed countries but also more advanced ones, population growth trends for Africa as a whole resemble those for the least developed countries as a group. Similarly, trends in Asia and in Latin America and the Caribbean generally resembles trends in less developed regions excluding the least developed countries (i.e., other less developed countries), although back in the 1950s, Latin America and the Caribbean grew faster. Trends in Europe resemble trends in more developed regions, except that growth has been consistently slower in Europe by about 0.2 to 0.3 percentage points (figure I.9). Countries from each of these four major areas constitute a large portion of the countries covered by the respective development groups. This is less true for the remaining two major areas, Northern America and Oceania and their growth trends appear more distinctive.

Growth in Northern America has been higher than growth in more developed regions as a whole back at least to 1950, is now higher by 0.7 percentage points and will stay at least 0.5 points higher up to 2050. Growth in Oceania, which encompasses a mix of countries from more developed to least developed, is most similar to trends in other less developed countries (i.e., less developed regions excluding the least developed countries). However, growth in Oceania dipped substantially below the trend for that development group from 1960 to 1990 and, although close to the development group average at the moment, is projected to decline more slowly. By 2050, while other less developed countries are projected to be growing at 0.2 per cent annually, Oceania will be growing at 0.5 per cent (figure I.9).

TABLE I.4. POPULATION AND ANNUAL GROWTH RATE BY MAJOR AREA AND REGION, SELECTED YEARS AND PERIODS

	Population (millions)				*Annual growth rate (percentage)*			
Major area or region	*1985*	*2005*	*2025*	*2050*	*1985-2005*	*2000-2005*	*2005-2025*	*2005-2050*
World	**4 855.3**	**6 514.8**	**8 010.5**	**9 191.3**	**1.47**	**1.24**	**1.03**	**0.55**
Africa	**554.3**	**922.0**	**1 393.9**	**1 997.9**	**2.54**	**2.32**	**2.07**	**1.72**
Eastern Africa	169.4	292.5	465.4	692.9	2.73	2.57	2.32	1.92
Middle Africa	63.4	112.5	191.3	312.7	2.87	2.81	2.65	2.27
Northern Africa	128.0	189.6	254.6	310.2	1.96	1.66	1.47	1.09
Southern Africa	37.5	54.9	60.6	65.0	1.91	1.10	0.49	0.38
Western Africa	156.0	272.5	422.0	617.0	2.79	2.58	2.19	1.82
Asia	**2 896.2**	**3 938.0**	**4 779.0**	**5 265.9**	**1.54**	**1.22**	**0.97**	**0.65**
Eastern Asia	1 254.9	1 522.5	1 653.6	1 591.2	0.97	0.62	0.41	0.10
South-Central Asia	1 106.9	1 645.8	2 146.0	2 536.0	1.98	1.64	1.33	0.96
South-Eastern Asia	399.3	557.7	686.3	766.6	1.67	1.40	1.04	0.71
Western Asia	135.1	212.1	293.1	372.0	2.25	1.95	1.62	1.25
Europe	**706.6**	**731.1**	**715.2**	**664.2**	**0.17**	**0.07**	**-0.11**	**-0.21**
Eastern Europe	303.5	297.8	267.3	221.7	-0.10	-0.47	-0.54	-0.66
Northern Europe	90.7	96.4	103.6	108.2	0.30	0.43	0.36	0.26
Southern Europe	140.5	150.3	153.2	146.3	0.34	0.61	0.10	-0.06
Western Europe	171.8	186.6	191.1	188.0	0.41	0.34	0.12	0.02
Latin America and the Caribbean	**404.5**	**558.0**	**688.0**	**769.2**	**1.61**	**1.29**	**1.05**	**0.71**
Caribbean	32.0	40.5	47.1	50.4	1.17	0.96	0.76	0.48
Central America	102.5	143.8	180.1	202.0	1.69	1.17	1.13	0.76
South America	269.9	373.7	460.8	516.8	1.63	1.38	1.05	0.72
Northern America	**269.0**	**332.2**	**393.0**	**445.3**	**1.06**	**1.02**	**0.84**	**0.65**
Oceania	**24.7**	**33.4**	**41.4**	**48.7**	**1.51**	**1.43**	**1.07**	**0.84**
Australia/New Zealand	18.9	24.4	29.2	33.3	1.27	1.19	0.89	0.69
Melanesia	4.9	7.8	10.8	13.8	2.33	2.21	1.62	1.27
Micronesia	0.4	0.5	0.7	0.8	2.04	1.59	1.20	0.90
Polynesia	0.5	0.6	0.8	0.9	1.20	1.02	0.91	0.61

These varying growth rates will alter the population shares of the major areas. Among the three development groups it was noted that the large proportion of the population in less developed regions excluding the least developed countries (i.e., other less developed countries) would remain largely unchanged to 2050. This is true also for Asia, Latin America and the Caribbean and Oceania. Asia has about 60 per cent of world population now and will go down slightly to 57 per cent. Latin America and the Caribbean has 9 per cent and will slip slightly to 8 per cent. Oceania similarly will show little change in share, staying at 0.5 per cent (table I.4).

The other two development groups go in opposite directions, with the least developed countries rising in their share of world population and the more developed regions falling. These trends in share also apply to Africa and Europe respectively. Africa rises from a 14 per cent share in 2005 to a 22 per cent share in 2050, while Europe drops from 11 per cent to 7 per cent. The last major area, Northern America, a more developed region with somewhat higher fertility and positive net migration, should hold its share at 5 per cent.

At least as notable as these changes in shares is the fact that each of the major areas except Europe will be contributing substantially to world population growth (figure I.10). Asia is contributing the most to growth, about 46 million additional people a year in 2005, more than twice

Figure I. 9. Annual growth rates for major world areas and development groups, 1950-2050

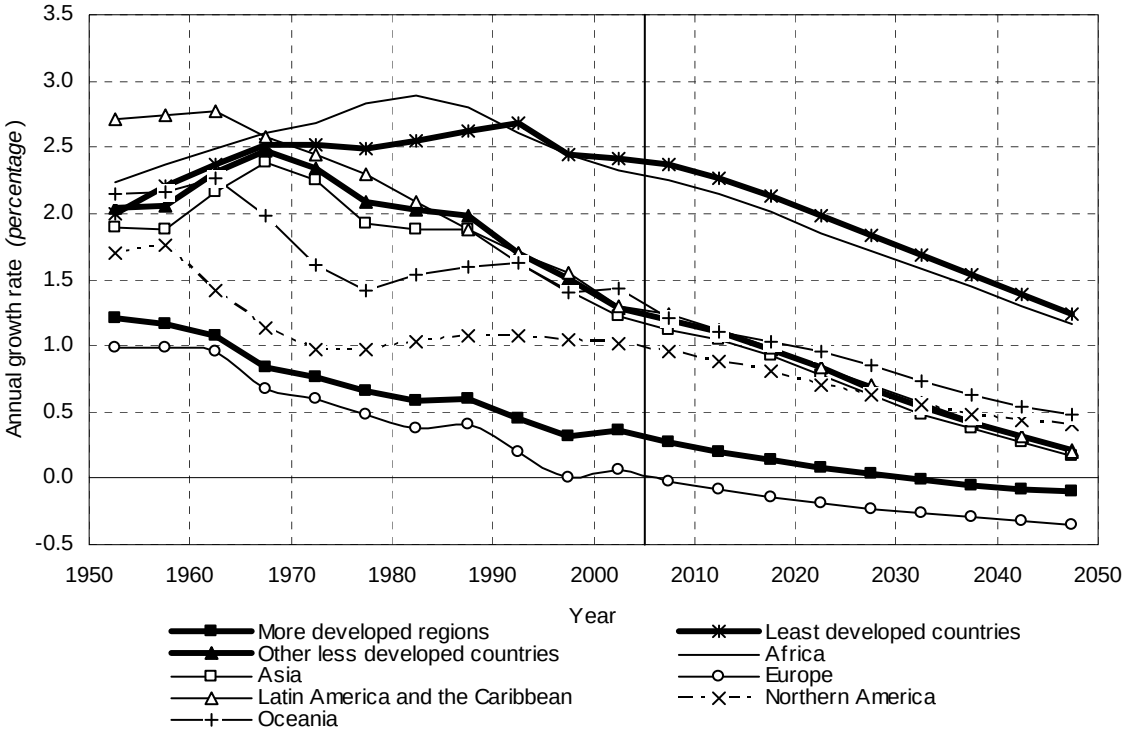
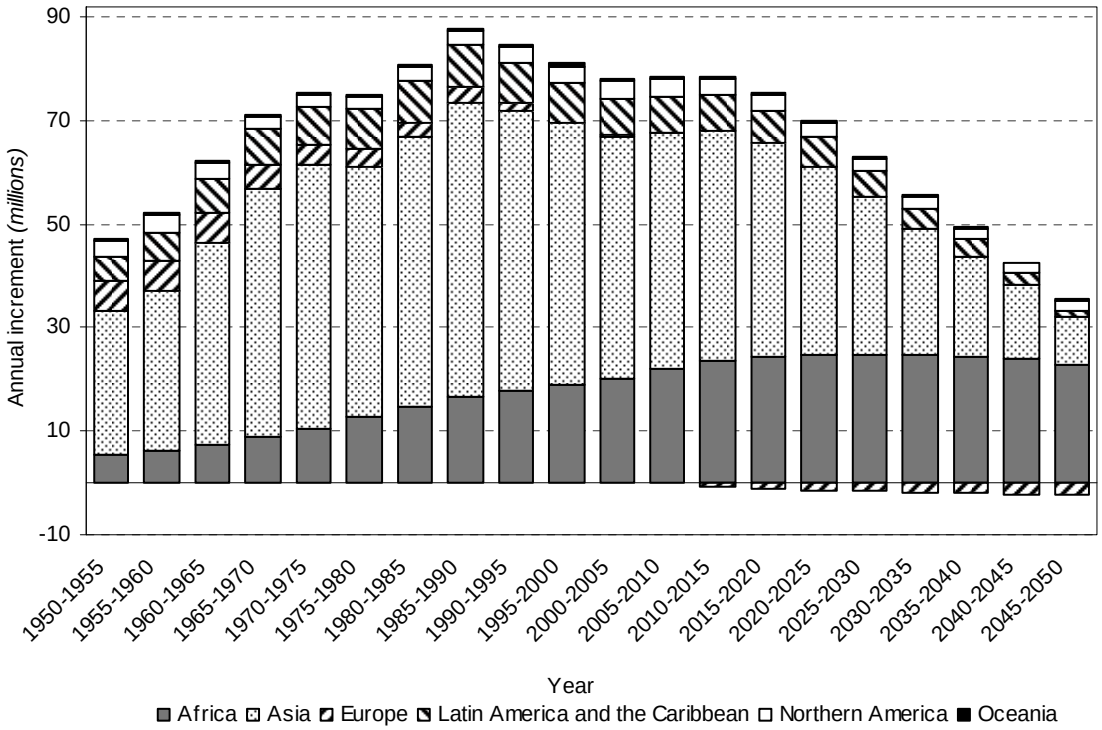


Figure I.10. Annual population increment by major world area, 1950-2050



the annual increment in Africa. The annual increment in Asia is falling, but the increment in Africa will hold steady at 21 to 25 million per year through 2050. The total increment between 2005 and 2050 will be 1.3 billion for Asia, about the equivalent of China's population in 2005 China and 1.1 billion for Africa, the equivalent of eight times the population of Nigeria in 2005.

Other regions will also be making their contributions to world population growth: Latin America and the Caribbean, 7 million a year in 2005 though only a fifth as much by 2050; Northern America, more than 3 million a year in 2005, down to about half as many by 2050; Oceania, 450,000 a year in 2005, also declining almost by half by 2050. From 2005 to 2050, the total increase will be 211 million for Latin America and the Caribbean, equal to the 2004 population of Brazil plus two-thirds the population of Argentina; 113 million for Northern America, or three-and-a-half times the population of Canada; and 15 million for Oceania, 70 per cent more than the population of all the countries of Melanesia, Micronesia and Polynesia combined.

Europe will be the only major area losing population: about 120,000 annually in 2005-2010, 650,000 annually in 2010-2015 and close to 2 million annually by 2035. The cumulative loss from 2005 to 2050 will be 67 million, slightly more than the population of France or the United Kingdom.

Population densities will rise in every major area except Europe (table I.5 and figure I.11). Average population density in Europe was the second highest among major geographic areas in 2005 (32 persons per sq. km.), though far behind Asia, which is four times more densely populated (124 persons per sq. km.). Africa in 2005 had almost the same population density as Europe (30 persons per sq. km.), but will surpass Europe by 2010 and by 2040 will be twice as densely populated compared to Europe. Latin America and the Caribbean is also experiencing increases in population density and will pass Europe by 2020. All the while, population density in Asia, already the highest in the world, will continue to rise and will reach 165 persons per sq. km. by 2050. Only Northern America and Oceania will not reach the level of density of Europe. Northern America will rise from 15 in 2005 to 20 persons per sq. km. in 2050. Oceania's population density will only slightly increase from 4 to 6 persons per sq. km. However, the average trend for Oceania as whole is dominated by sparsely populated Australia, masking the trends for the small island states in the Pacific, much with very high population densities.

Interpreting densities is complicated not only by variability in land and its resources but also by urbanization, the way resources are used and the way they flow across borders in an era of globalization. To provide an additional perspective, one can look at the relationship of population to fresh water availability. Water also flows across borders, but only between contiguous countries and the extent of surface flows is at least taken into account in United Nations Statistical Division estimates (United Nations, 2007a).

Per capita availability of renewable fresh water is greatest in Oceania and in Latin America and the Caribbean. On the assumption that the total amount per country is relatively stable, one can estimate, however, that per capita availability has fallen most steeply in these two major areas and will continue to fall (table I.5 and figure I.12). Northern America has about half the water per capita of Latin America and the Caribbean, Europe about a third. Northern America will slowly approach European levels, while Europe moves up slightly. Water availability is much lower in Africa, with 60 per cent of the water per capita of Europe and in Asia, with 40 per cent. By 2050, assuming that water resources do not change, Africa will have less per capita than Asia. Both will be at around 2,900 cubic meters per capita, still above the level assumed to represent water stress (1,700 cubic meters per capita; see Gleick 1995, Hinrichsen, Robey and Upadhyay 1998) but moving toward it. Smaller regions and individual countries vary tremendously in water availability, however, so some are already below that point.

More optimistic or pessimistic possibilities are provided by low growth and high growth projection scenarios. At the world level, it was noted above that these scenarios lowered or raised future population for 2050 by about 15 per cent. Roughly the same is true for major world areas. In the high scenario, population by 2050 is higher by 15 per cent to 19 per cent in each area relative to the medium scenario. In the low scenario, it is lower by 14 per cent to 17 per cent. Given little variation in these percentages, distribution of world population would be little affected if the same scenario is applied across major areas. Nevertheless, if one of these alternative scenarios comes true, it could have far-reaching consequences.

C. Regions and countries

Each major area except Northern America is divided into three to five regions. These regions are generally of unequal population size and often have different demographic prospects.

TABLE I.5. POPULATION DENSITY AND RENEWABLE FRESH WATER PER CAPITA BY MAJOR AREA AND REGION, SELECTED YEARS

	Density (persons per sq. km.)				*Renewable fresh water (cubic meters per capita)*			
Major area or region	*1985*	*2005*	*2025*	*2050*	*1985*	*2005*	*2025*	*2050*
Africa	**18**	**30**	**46**	**66**	**10 263**	**6 170**	**4 081**	**2 847**
Eastern Africa	27	46	73	109	6 083	3 523	2 214	1 487
Middle Africa	10	17	29	47	46 730	26 346	15 492	9 480
Northern Africa	15	22	30	36	2 218	1 498	1 115	915
Southern Africa	14	21	23	24	2 706	1 846	1 673	1 558
Western Africa	25	44	69	101	8 391	4 804	3 102	2 121
Asia	**91**	**124**	**150**	**165**	**5 289**	**3 890**	**3 205**	**2 909**
Eastern Asia	107	129	141	135	2 766	2 280	2 099	2 181
South-Central Asia	103	153	199	235	3 884	2 612	2 003	1 695
South-Eastern Asia	89	124	153	171	17 688	12 665	10 292	9 213
Western Asia	28	44	61	77	3 588	2 286	1 654	1 303
Europe	**31**	**32**	**31**	**29**	**10 704**	**10 345**	**10 574**	**11 387**
Eastern Europe	16	16	14	12	16 732	17 054	19 000	22 907
Northern Europe	50	53	57	60	12 406	11 682	10 863	10 407
Southern Europe	107	114	116	111	5 263	4 919	4 825	5 053
Western Europe	155	168	172	170	3 606	3 320	3 242	3 296
Latin America and the Caribbean	**20**	**27**	**33**	**37**	**45 919**	**33 288**	**26 996**	**24 146**
Caribbean	137	173	201	215	2 923	2 311	1 987	1 859
Central America	41	58	73	81	11 508	8 205	6 550	5 839
South America	15	21	26	29	64 092	46 298	37 547	33 477
Northern America	**12**	**15**	**18**	**20**	**21 831**	**17 677**	**14 945**	**13 189**
Oceania	**3**	**4**	**5**	**6**	**64 337**	**47 538**	**38 344**	**32 585**
Australia/New Zealand	2	3	4	4	37 745	29 254	24 488	21 474
Melanesia	9	14	20	26	178 254	111 801	80 904	63 196
Micronesia	115	173	221	260	…	…	…	…
Polynesia	60	77	92	101	…	…	…	…

Figure I.11. Population density in major world areas, 1950-2050

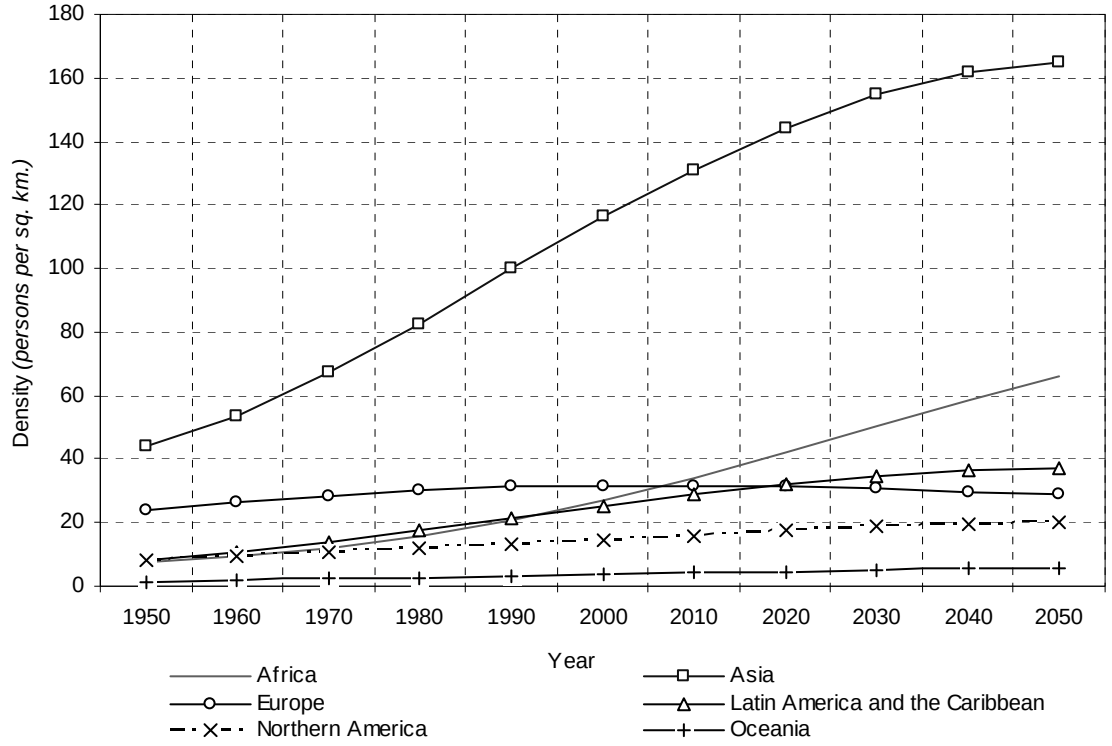
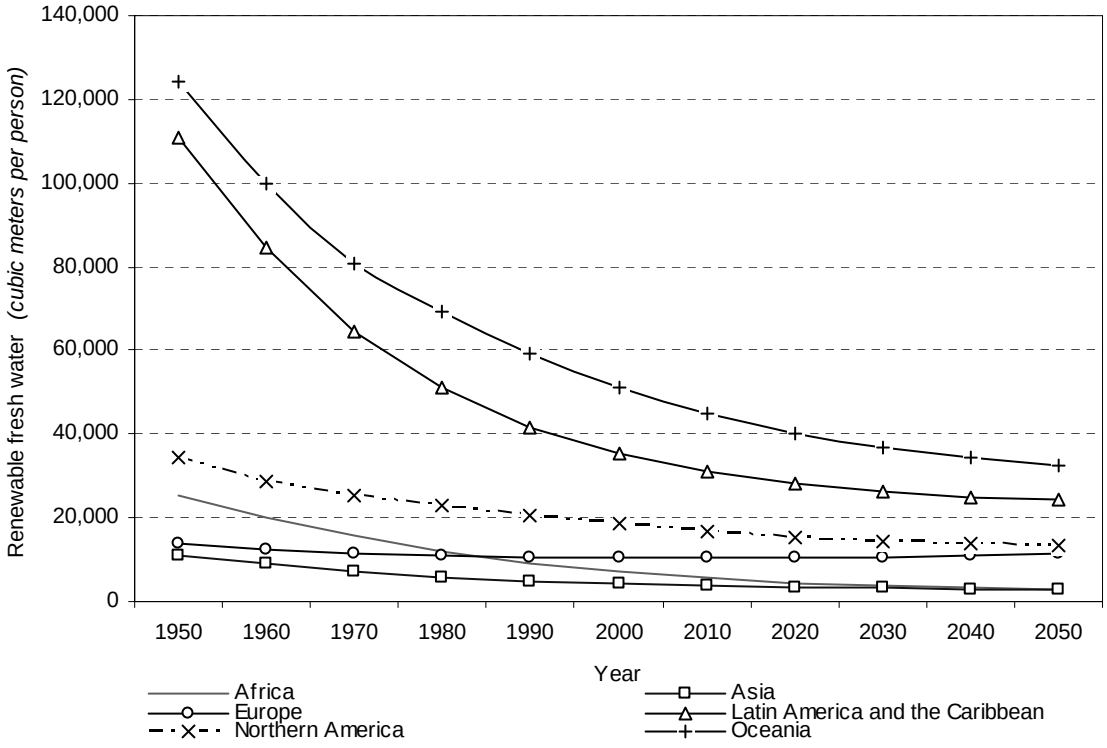


Figure I.12. Water availability per capita in major world areas, 1950-2050



1. *Africa*

Africa has three-quarters of its population in the three tropical regions: Eastern Africa has 32 per cent of the total in 2005, Western Africa 30 per cent and Middle Africa 12 per cent. Northern Africa has the bulk of the remainder, 21 per cent of the total and Southern Africa, which includes only South Africa and four much smaller countries, has 6 per cent. The tropical regions are growing faster, at 2.6 per cent each annually, in contrast to 1.7 per cent for Northern Africa and 1.1 per cent for Southern Africa (table I.4). Growth rates are expected to fall in each region by roughly 1 percentage point each by 2040, so the contrast in rates is projected to continue. The three tropical regions are contributing proportionally more than their share to population growth in Africa: 80 per cent of the increment currently, rising to 92 per cent by 2045-2050.

Each African region has countries of varying population size but generally similar demographic outlooks (table I.6). Each has exactly one country

TABLE I.6. POPULATION IN THE LARGEST COUNTRIES IN EACH MAJOR AREA, 2005, 2025 AND 2050
(millions)

Major area and country	*2005*		*2025*		*2050*	
	Number	*(Rank)*	*Number*	*(Rank)*	*Number*	*(Rank)*
Africa						
Nigeria	141.4	(1)	210.1	(1)	288.7	(1)
Ethiopia	79.0	(2)	125.0	(2)	183.4	(3)
Egypt	72.8	(3)	98.5	(4)	121.2	(4)
Democratic Rep. of the Congo	58.7	(4)	107.5	(3)	186.8	(2)
South Africa	47.9	(5)	52.3	(9)	55.6	(9)
United Rep. of Tanzania	38.5	(6)	60.0	(5)	85.1	(6)
Uganda	28.9	(11)	54.0	(8)	92.9	(5)
Asia						
China	1 313.0	(1)	1 445.8	(2)	1 408.8	(2)
India	1 134.4	(2)	1 447.5	(1)	1 658.3	(1)
Indonesia	226.1	(3)	271.2	(3)	296.9	(3)
Pakistan	158.1	(4)	225.0	(4)	292.2	(4)
Bangladesh	153.3	(5)	206.0	(5)	254.1	(5)
Europe						
Russian Federation	144.0	(1)	128.2	(1)	107.8	(1)
Germany	82.7	(2)	80.3	(2)	74.1	(2)
France	61.0	(3)	65.8	(3)	68.3	(4)
United Kingdom	60.2	(4)	65.2	(4)	68.7	(3)
Italy	58.6	(5)	58.1	(5)	54.6	(5)
Latin America and the Caribbean						
Brazil	186.8	(1)	228.8	(1)	254.1	(1)
Mexico	104.3	(2)	124.7	(2)	132.3	(2)
Colombia	44.9	(3)	55.6	(3)	61.9	(3)
Argentina	38.7	(4)	46.1	(4)	51.4	(4)
Peru	27.3	(5)	34.1	(6)	39.0	(6)
Venezuela (Bolivarian Rep. of)	26.7	(6)	35.4	(5)	42.0	(5)
Northern America						
United States of America	299.8	(1)	354.9	(1)	402.4	(1)
Canada	32.3	(2)	37.9	(2)	42.8	(2)
Oceania						
Australia	20.3	(1)	24.4	(1)	28.0	(1)
Papua New Guinea	6.1	(2)	8.6	(2)	11.2	(2)
New Zealand	4.1	(3)	4.8	(3)	5.2	(3)
Fiji	0.8	(4)	0.9	(4)	0.9	(5)
Solomon Islands	0.5	(5)	0.7	(5)	1.0	(4)

with population over 45 million, at least one with fewer than 1.5 million and generally (except for Southern Africa) several countries of intermediate size. Three of the five largest countries dominate their regions with a majority of the regional population. South Africa has 83 per cent of the population of Southern Africa, whereas the Democratic Republic of the Congo and Nigeria have just over half the populations of Middle Africa and Western Africa respectively. Though often thought of as dominant, Egypt, in Northern Africa, only has somewhat over a third of regional population. In the diverse and geographically extensive region of Eastern Africa, Ethiopia is the largest but has only 27 per cent of the total.

Through 2050, Ethiopia and Nigeria will double in size, but the Democratic Republic of the Congo will triple, rising to 60 per cent of regional population. Egypt will add fewer people, expanding by two-thirds and South Africa will add fewer, 16 per cent. Except for the Democratic Republic of the Congo, these large countries are not among the fastest growing in Africa. For 2000-2005, that distinction belongs to the Western Sahara, Sierra Leone, Eritrea and Chad (table I.7). Substantial immigration in each case, related to political conflict or the resolution of conflict, was a major factor in rapid growth, combining an unpredictable element with already high fertility. As these migrant waves are expected to ebb, growth rates in these four countries are projected to fall much more than in other countries. Over the entire period from 2005 to 2050, the fastest growing countries are expected to be Niger, Liberia and Burundi, with Niger quadrupling in size and Liberia and Burundi growing by 260 per cent.

At the other end of the scale, some of the smallest countries are growing much slower than average, particularly island countries: Seychelles and Saint Helena, which are actually too small to include among the 195 countries in the main projections, as well as Mauritius. These are not the slowest growing, however. That distinction belongs to Zimbabwe, where growth in 2000-2005 was only 0.7 per cent. If island countries are constrained by limited resources, Zimbabwe may have been constrained by ineffective use of its resources. As with the countries where growth is helped by migration, the factors limiting growth in Zimbabwe are expected to recede, so growth rates are projected to fall less than in other countries.

Population densities are about equal in Western and Eastern Africa at 44 and 46 persons per sq. km (table I.5). The other three regions are at half or less of this density, accounting for the continental average of 30. Southern and Northern Africa are at 21 persons per sq. km. to 22 persons per sq. km. and Middle Africa is lower at 17 persons per sq. km. However, regional averages are a poor guide to country densities, which vary considerably.

Some of the highest densities are in island countries: Mauritius, the Comoros, Réunion, Seychelles and São Tomé and Principe (table I.8). In this top group also are Rwanda and Burundi. Density in Rwanda, at 351 persons per sq. km. in 2005, is above its previous peak before the 1994genocide (277 persons per sq. km.). Density is projected to rise in all these countries, most spectacularly in Burundi and Rwanda, where the increases to 2025 will be 90 per cent and 65 per cent respectively. The increases to 2050 will be 260 per cent and 145 per cent respectively.

In contrast to these densely populated tropical countries, the least densely populated are to the north or south: the Western Sahara, Namibia, Mauritania, Botswana and Libya. Population density is projected to more than double in two of these countries, the Western Sahara and Mauritania. In all five, however, it will remain very low, at under 6 persons per sq. km. This will not mean an abundance of exploitable land, however, since much of the territory of each country is largely desert.

In fact, if one looks at water rather than land, Libya is not near the top but at the very bottom with only 100 cubic meters of renewable fresh water per capita (table I.9). Much of the rest of Northern Africa is also below the level of 1 000 cubic meters of water per capita that is generally taken to represent water scarcity (a more severe condition than water stress). Egypt is just above this level. By 2050, if water resources are not augmented, the number of countries throughout Africa that will be below this critical level will have risen from 11 to 21.

TABLE I.7. HIGHEST AND LOWEST ANNUAL POPULATION GROWTH RATES BY MAJOR AREA IN 2000-2005, 2005-2025 AND 2005-2050

(percentage)

	2000-2005		2005-2025		2005-2050	
Major area and country	*Rate*	*(Rank)*	*Rate*	*(Rank)*	*Rate*	*(Rank)*
Africa						
Western Sahara	6.68	(1)	2.82	(8)	1.68	(28)
Sierra Leone	4.23	(2)	2.18	(25)	1.96	(17)
Eritrea	4.12	(3)	2.65	(13)	2.07	(13)
Niger	3.52	(5)	3.41	(1)	3.09	(1)
Liberia	2.28	(32)	3.38	(2)	2.86	(2)
Burundi	3.29	(6)	3.25	(3)	2.85	(3)
Swaziland	1.22	(47)	0.50	(53)	0.42	(51)
South Africa	1.09	(51)	0.44	(54)	0.33	(54)
Lesotho	0.99	(52)	0.55	(52)	0.39	(52)
Mauritius	0.91	(53)	0.63	(51)	0.34	(53)
Zimbabwe	0.72	(54)	0.98	(49)	0.84	(47)
Asia						
Timor-Leste	5.31	(1)	3.17	(1)	2.62	(1)
Qatar	5.11	(2)	1.63	(17)	1.15	(17)
United Arab Emirates	4.69	(3)	2.12	(6)	1.62	(6)
Afghanistan	3.79	(5)	3.14	(2)	2.56	(2)
Occupied Palestinian Territory	3.56	(6)	2.77	(3)	2.23	(4)
Yemen	2.97	(7)	2.75	(4)	2.25	(3)
Japan	0.14	(48)	-0.25	(49)	-0.49	(49)
Armenia	-0.42	(49)	-0.19	(48)	-0.46	(48)
Georgia	-1.07	(50)	-0.63	(50)	-0.79	(50)
Europe						
Ireland	1.71	(1)	1.21	(1)	0.89	(2)
Spain	1.52	(2)	0.36	(10)	0.15	(10)
Iceland	1.02	(3)	0.66	(3)	0.40	(4)
Luxembourg	0.89	(4)	1.10	(2)	1.02	(1)
Norway	0.66	(7)	0.60	(4)	0.47	(3)
Belarus	-0.52	(34)	-0.61	(38)	-0.76	(38)
Bulgaria	-0.66	(36)	-0.84	(40)	-1.00	(40)
Ukraine	-0.81	(38)	-0.81	(39)	-0.93	(39)
Moldova	-1.34	(39)	-0.52	(34)	-0.66	(36)
Montenegro	-1.95	(40)	0.04	(21)	-0.02	(17)
Latin America and the Caribbean						
French Guiana	3.02	(1)	2.12	(2)	1.66	(2)
Aruba	2.61	(2)	0.20	(31)	0.01	(27)
Guatemala	2.48	(3)	2.25	(1)	1.71	(1)
Honduras	1.96	(7)	1.74	(3)	1.27	(3)
Cuba	0.21	(34)	-0.01	(35)	-0.28	(35)
United States Virgin Islands	0.16	(35)	-0.21	(36)	-0.68	(36)
Guyana	0.14	(36)	-0.40	(37)	-0.97	(37)
Uruguay	0.05	(37)	0.32	(27)	0.20	(24)
Northern America						
United States of America	1.03	(1)	0.84	(1)	0.65	(1)
Canada	1.01	(2)	0.81	(2)	0.63	(2)
Oceania						
Solomon Islands	2.57	(1)	2.00	(2)	1.56	(2)
Vanuatu	2.54	(2)	2.10	(1)	1.66	(1)
Papua New Guinea	2.41	(3)	1.72	(3)	1.35	(3)
Samoa	0.71	(9)	0.68	(9)	0.35	(11)
Fiji	0.65	(10)	0.45	(12)	0.21	(12)
Micronesia (Fed. States of)	0.55	(11)	0.64	(10)	0.44	(10)
Tonga	0.26	(12)	0.59	(11)	0.47	(9)

TABLE I.8. POPULATION DENSITY IN COUNTRIES WITH THE HIGHES AND THE LOWEST POPULATION DENSITY IN EACH MAJOR AREA, 2005, 2025 AND 2050

(persons per sq. km.)

	2005		2025		2050	
Major area and country	*Number*	*(Rank)*	*Number*	*(Rank)*	*Number*	*(Rank)*
Africa						
Mauritius	608.4	(1)	689.4	(1)	709.0	(4)
Comoros	357.0	(2)	544.6	(3)	767.2	(3)
Rwanda	350.6	(3)	577.9	(2)	859.1	(2)
Burundi	282.3	(5)	540.4	(4)	1017.3	(1)
Botswana	3.2	(51)	3.9	(52)	4.6	(52)
Mauritania	2.9	(52)	4.4	(51)	6.2	(50)
Namibia	2.5	(53)	3.1	(53)	3.7	(53)
Western Sahara	1.7	(54)	2.9	(54)	3.5	(54)
Asia						
China, Macao SAR	18 195.8	(1)	20 596.0	(1)	20 138.6	(1)
China, Hong Kong SAR	6 421.7	(2)	7 557.0	(2)	8 171.1	(2)
Singapore	6 336.0	(3)	7 472.5	(3)	7 358.3	(3)
Bangladesh	1 064.5	(4)	1 430.7	(4)	1 764.5	(4)
Bahrain	1 044.4	(5)	1 400.9	(5)	1 690.3	(7)
Maldives	990.9	(6)	1 377.9	(6)	1 709.7	(5)
Turkmenistan	9.9	(47)	12.4	(47)	13.9	(48)
Oman	8.1	(48)	11.7	(48)	15.0	(47)
Kazakhstan	5.6	(49)	6.2	(49)	6.4	(49)
Mongolia	1.6	(50)	2.0	(50)	2.2	(50)
Europe						
Malta	1 274.1	(1)	1 365.3	(1)	1 355.9	(1)
Channel Islands	762.2	(2)	777.7	(2)	738.5	(2)
Netherlands	393.2	(3)	408.4	(3)	415.0	(3)
Norway	12.0	(38)	13.6	(38)	14.9	(38)
Russian Federation	8.4	(39)	7.5	(39)	6.3	(39)
Iceland	2.9	(40)	3.3	(40)	3.4	(40)
Latin America and the Caribbean						
Barbados	678.9	(1)	705.5	(1)	631.5	(1)
Aruba	571.7	(2)	595.4	(2)	575.4	(2)
Puerto Rico	444.7	(3)	487.7	(3)	498.2	(4)
Haiti	335.0	(5)	443.4	(4)	550.4	(3)
Guyana	3.4	(35)	3.2	(36)	2.2	(37)
Suriname	2.8	(36)	2.9	(37)	2.6	(36)
French Guiana	2.1	(37)	3.3	(35)	4.5	(35)
Northern America						
United States of America	31.1	(1)	36.9	(1)	41.8	(1)
Canada	3.2	(2)	3.8	(2)	4.3	(2)
Oceania						
Guam	307.0	(1)	385.2	(1)	440.0	(1)
Micronesia (Fed. States of)	156.8	(2)	178.1	(2)	190.9	(2)
Tonga	152.9	(3)	171.9	(3)	188.5	(3)
New Zealand	15.1	(9)	17.6	(10)	19.3	(11)
Papua New Guinea	13.1	(10)	18.5	(9)	24.1	(9)
New Caledonia	12.6	(11)	16.3	(11)	19.4	(10)
Australia	2.6	(12)	3.2	(12)	3.6	(12)

TABLE 1.9. RENEWABLE FRESH WATER IN COUNTRIES WITH THE LEAST AMOUNT PER CAPITA IN EACH MAJOR AREA, 2005, 2025 AND 2050
(cubic meters per capita)

	2005		2025		2050	
Major area and country	*Amount*	*(Rank)*	*Amount*	*(Rank)*	*Amount*	*(Rank)*
Africa						
Libyan Arab Jamahiriya	101	(1)	74	(1)	62	(1)
Djibouti	373	(2)	269	(3)	203	(3)
Tunisia	413	(3)	343	(6)	316	(7)
Burundi	458	(5)	239	(2)	127	(2)
Algeria	436	(4)	334	(4)	289	(5)
Rwanda	563	(6)	342	(5)	230	(4)
Asia						
Kuwait	7	(1)	5	(1)	4	(1)
Occupied Palestinian Territory	15	(2)	9	(2)	5	(2)
United Arab Emirates	37	(3)	24	(3)	18	(3)
Qatar	67	(4)	48	(4)	40	(4)
Maldives	102	(5)	73	(6)	59	(6)
Saudi Arabia	102	(6)	69	(5)	53	(5)
Europe						
Malta	166	(1)	155	(1)	156	(1)
Czech Republic	1 570	(2)	1 615	(2)	1 813	(3)
Italy	1 620	(3)	1 636	(3)	1 740	(2)
Poland	1 649	(4)	1 734	(4)	2 082	(5)
Romania	1 956	(5)	2 169	(6)	2 655	(10)
Belgium	2 020	(6)	1 955	(5)	1 973	(4)
Latin America and the Caribbean						
Bahamas	62	(1)	50	(1)	45	(1)
Barbados	274	(2)	264	(2)	295	(2)
Haiti	1 509	(3)	1 140	(3)	918	(3)
Puerto Rico	1 799	(4)	1 640	(4)	1 606	(5)
Dominican Republic	2 218	(5)	1 725	(5)	1 503	(4)
Northern America						
United States of America	8 264	(1)	6 982	(1)	6 158	(1)
Canada	86 519	(2)	73 645	(2)	65 303	(2)
Oceania						
Australia	19 054	(1)	15 865	(1)	13 801	(1)
Fiji	34 479	(2)	31 533	(2)	31 376	(2)

2. Asia

Across Asia's four regions, population is larger in South-Central Asia (42 per cent of the total) and Eastern Asia (39 per cent) and smaller in South-Eastern Asia (14 per cent) and Western Asia (5 per cent) as seen in table I.4. China and India have over a billion people, three other countries have over 100 million and three more have over 70 million (table I.6 and figure I.13). China is 87 per cent of Eastern Asia and India 69 per cent of South-Central Asia. Together they have close to two-thirds of the Asian population.

Population growth has been slowing in each region, largely following parallel though distinct paths since the mid-1980s (table I.4 and figure I.14). The slowest growth has been in Eastern Asia, where annual growth fell to 0.7 per cent in 2000-2005. Growth has been higher, at 1.4 per cent, in South-Eastern Asia, still higher, at 1.6 per cent, in South-Central Asia, and highest in Western Asia at 1.9 per cent. With parallel

Figure I.13. Population in Asian regions and all their countries larger than 70 million in 2005

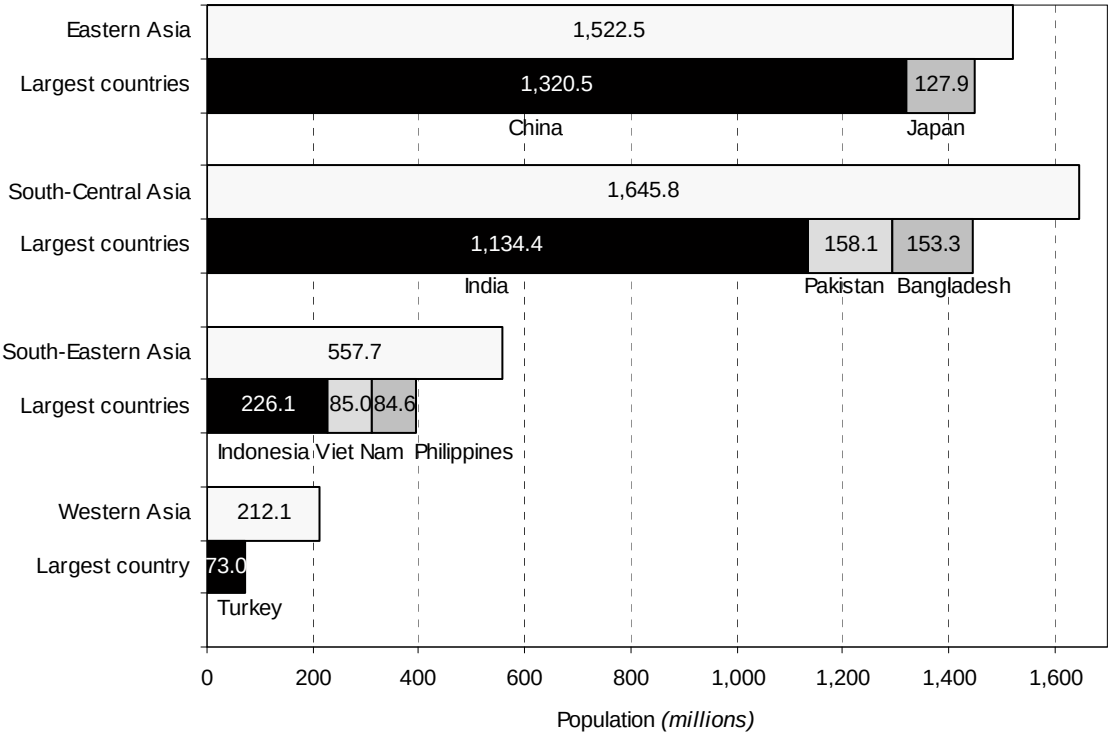
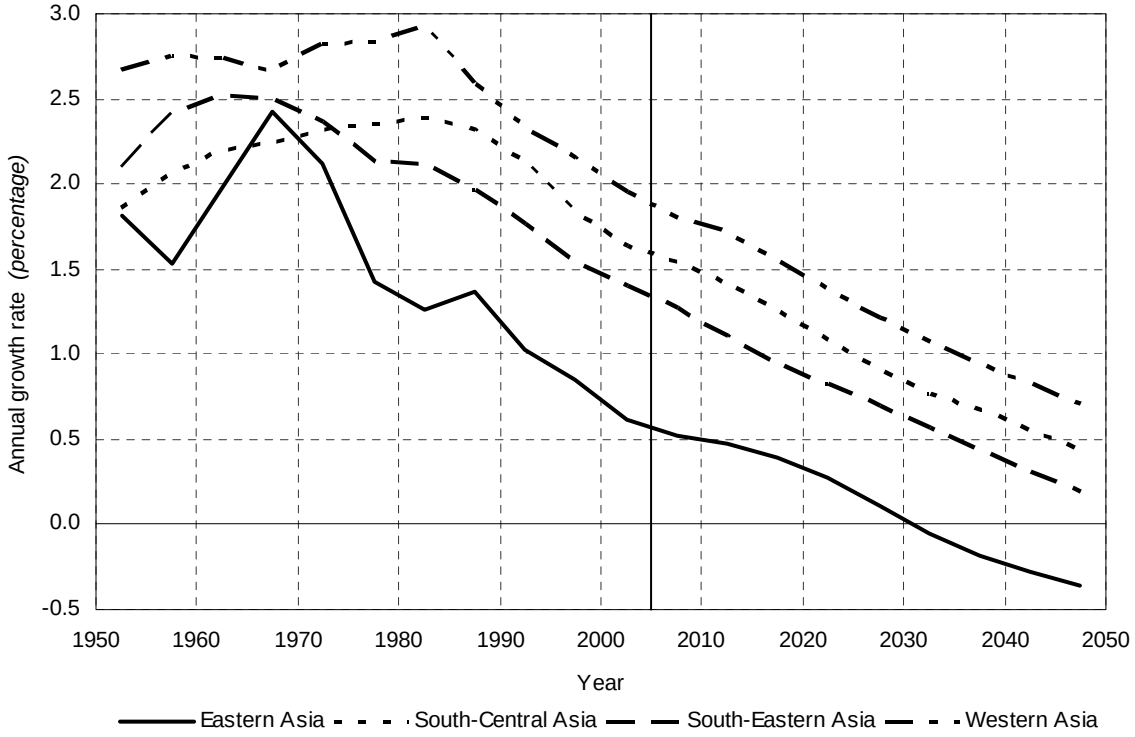


Figure I.14. Annual growth rates for Asian regions, 2005-2050



reductions, growth will turn negative after 2030 in Eastern Asia and decline but stay positive elsewhere.

Despite the gradient from slow growth in the east to rapid growth in the west, the fastest growing country is far to the east: the young nation of Timor-Leste, with a combination of very high fertility and many returning refugees (table I.7). At 5.3 per cent annual growth from 2000 to 2005, Timor-Leste not only grew fastest in Asia but also faster than all but one country in Africa, the Western Sahara. Also growing faster than all but one African country were two Western Asian countries, Qatar and the United Arab Emirates and other Gulf States were not far behind. Migration to the Gulf is projected to ease off and growth to moderate faster than in some other regions.

In addition to the rapidly growing Gulf countries, Western Asia includes such high-fertility countries as the Occupied Palestinian Territories and Yemen; a large country with a third of regional population in Turkey; and the Transcaucasian countries to the north—Armenia, Azerbaijan and Georgia—with slow and even negative growth. South-Central Asia similarly has countries with high current and projected growth in Afghanistan, Bhutan and Nepal. The regional giant of India had relatively moderate growth of 1.6 per cent in 2000-2005 and Pakistan and Bangladesh grew slightly faster at 1.8 per cent and 1.9 per cent. Such rates are matched or exceeded, farther to the east, only in Timor-Leste, Brunei Darussalam and the Philippines, growth in the latter two countries being 2.3 per cent and 2.1 per cent. In China, population growth is down to 0.7 per cent annually and is projected to turn negative by 2030. In the Republic of Korea, negative growth could start earlier, around 2020 and in Japan may have started in this quinquennium (table I.7).

Despite somewhat more moderate growth rates and some falling ones, Asia will contribute much more to world population growth than Africa. Of the increment to world population from 2005 to 2025, Asia will be responsible for 58 per cent, versus Africa's 32 per cent (see figure I.10). For the increment for the entire period from 2005 to 2050, Africa's share will be larger at 41 per cent but still smaller than Asia's share of 50 per cent. Much of the increment in Asia will not be in Western Asia, despite the higher growth rates to the west, but in South-Central Asia, where large current populations will account for a third of the total increment in less developed regions.

The most densely populated countries or territories in Asia are Macao, China (18,196 persons per sq. km. in 2005), Hong Kong, China (6,422 persons per sq. km.) and Singapore (6,336 persons per sq. km.) as seen in table I.8. As cities encompassing very limited hinterlands, these three countries or areas are in a class with, though much larger than, such entities as Monaco and the Holy See. The most densely populated country in Asia apart from these three is Bangladesh, with 1,064 persons per sq. km. in 2005. Bahrain, a mostly urban small country, is close behind, followed by the archipelago of the Maldives and the Occupied Palestinian Territories. The densities in these three countries are higher than in any African country. Each of these countries or areas is growing substantially in population density, with the Maldives almost doubling in density by 2050 and the Occupied Palestinian Territories almost tripling. By 2050, each of these four will be at around 1,700 persons per sq. km., essentially at about one fourth the level of Singapore or Hong Kong, China, in 2005.

The other current highest-density countries in Asia are a varied group, mostly growing more slowly or even declining in population density. Falling population densities will characterize the Republic of Korea and Japan and eventually Sri Lanka. However, Lebanon, India, Israel and the Philippines will all continue to grow more densely populated, with population density increasing fastest in the Philippines, rising by two-thirds to 2050. At the other extreme, the least densely populated countries in Asia and hardly growing, are Mongolia (2 persons per sq. km.) and Kazakhstan (6 persons per sq. km.). Other Central Asian countries are also near the bottom in population density, as are Oman and Saudi Arabia and such rapidly growing countries as Afghanistan and Yemen.

Though in a crude sense land is not an issue for the low-density countries, they may face a different resource problem, water availability. As a whole, Eastern, Western and South-Central Asia

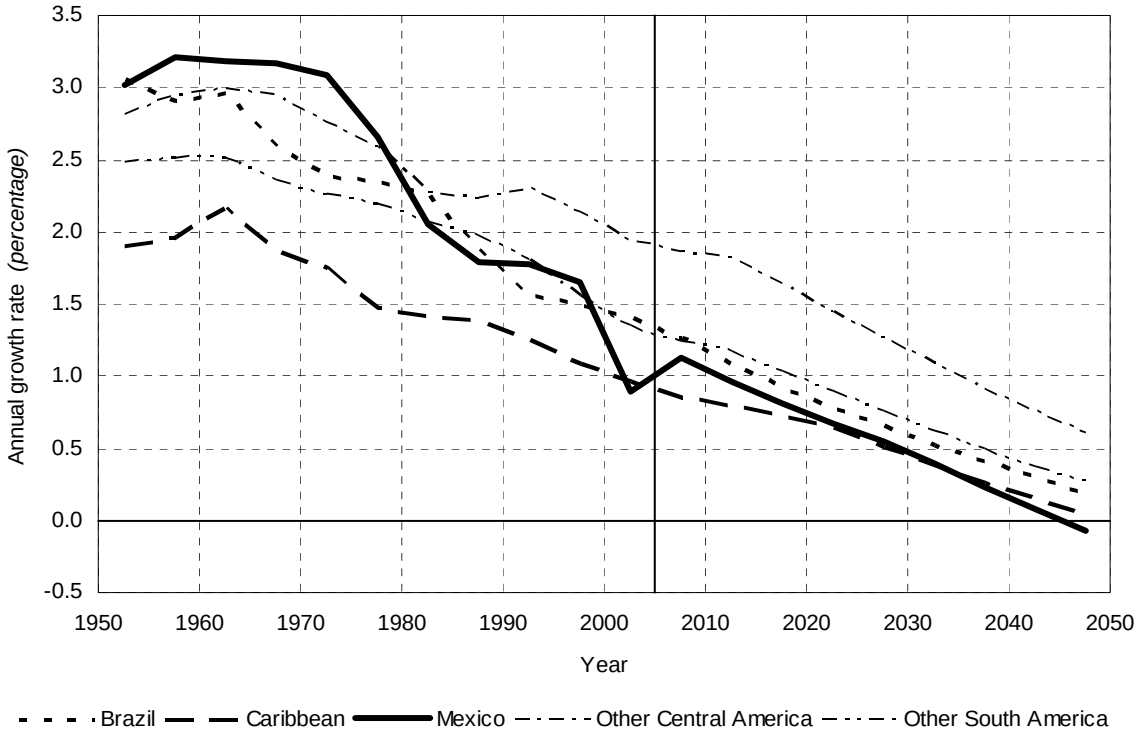
each have less renewable fresh water per capita than other regions around the world, except for Northern and Southern Africa (table I.5). Individual countries are far worse off (table I.9), with several Western Asian countries down to as low as 7 cubic meters per capita. Whereas such countries as Kuwait may have the means to deal with water scarcity, one might have more concern about the Occupied Palestinian Territories, the Maldives, or Yemen. Assuming supplies are not augmented, water availability per capita, already well below the scarcity threshold, will fall almost two-thirds by 2050.

3. Latin America and the Caribbean

In 2005, two-thirds of the population of Latin America and the Caribbean was in South America, 25 per cent in Central America (including Mexico) and 10 per cent in the Caribbean (table I.4). As is the case elsewhere, individual countries dominate their respective regions (table I.6). Almost three-quarters of the Central American population is in Mexico and almost half of the South American population is in Brazil. The population of the Caribbean is less concentrated, with over a third in Cuba and close to a fifth in Haiti.

Growth rates for 1950-2050 are shown in figure I.15 for Mexico and Brazil, for the remainder of their regions and for the Caribbean. For 2000-2005, population growth was highest in Central America excluding Mexico, at 1.9 per cent annually, more than twice the rate in Mexico. Growth rates were intermediate in Brazil, at 1.4 per cent and almost the same in the rest of South America combined. Growth in the Caribbean was just slightly higher than in Mexico. By 2050, it is expected that Mexico and the Caribbean will

Figure I.15. Annual growth rates for Latin America and the Caribbean regions, 2005-2050



be at zero growth and Brazil and the rest of South America slightly above that level. Only trends in Central America excluding Mexico are projected to be clearly distinct, at 0.8 to 0.5 percentage points higher than the other regions. The regional distribution of the population will shift away from the Caribbean and toward Central America, but only by a few percentage points. Across the three regions, population increments will be proportional to population size for South America. With 67 per cent of the population, it will contribute 67 per cent of the increment from 2005 to 2025. Increments will be slightly lower as a proportion of the total from the Caribbean and slightly higher for Central America

The highest population growth rates by country in Latin America and the Caribbean are generally more modest than those in Asia and especially in Africa (table I.7). The highest rate for 2000-2005 is in French Guiana at 3.0 per cent, followed by Aruba at 2.6 per cent. Also near the top are all the Central American countries except Mexico, three South American countries—Paraguay, the Plurinational State of Bolivia and the Bolivarian Republic of Venezuela—and one Caribbean country, Haiti. Except for Aruba, growth rates are projected to decline in these countries roughly at the same pace. Aruba, a self-governing part of the Netherlands, had substantial worker migration to support the tourist industry, but the flow is not projected to continue.

Apart from this exception, growth trends appear more uniform in Latin America and the Caribbean than in Africa or Asia, in the sense that sudden declines in growth are rarer. Countries are projected to move largely en bloc. Rankings of countries by size will therefore be little affected. The Bolivarian Republic of Venezuela is indeed on the verge of becoming bigger than Peru, taking over the fifth rank by country size, but in 2005 the Bolivarian Republic of Venezuela was only 2 per cent smaller, so such changes are relatively minor.

Population densities are quite variable between regions: 173 persons per sq. km. in the Caribbean in 2005, as opposed to only 58 in Central America and 21 in South America (table I.5). The countries in Latin America and the Caribbean with the highest population densities are all in the Caribbean except for El Salvador (table I.8). There are no countries in the group with extremely high population densities, as none of them comes close to the current population density in Bangladesh, for example. Barbados, the country with the highest population density in Latin America and the Caribbean, was at 679 persons per sq. km. in 2005, higher than Mauritius but only 60 per cent the level of Bangladesh. Equally notable is the fact that population densities fall in some of these countries, generally after an initial slight rise and rise only moderately in others, even over four-and-a-half decades. The exceptions are Haiti and El Salvador, where density is projected to rise two-thirds and one-half respectively by 2050. Still, even these two will not reach current levels in Bangladesh, much less future projected levels.

The countries with lowest population density, with only two or three persons per sq. km., are also the three smallest ones, in both population and area, on the South American continent: French Guiana, Guyana and Suriname (table I.8)[2].

Water availability varies by region (table I.5), with the lowest availability in the Caribbean, at 2,300 cubic meters of renewable fresh water per capita. (This does not take into account some of the smallest countries, for which data are unavailable). South America is at the other end, with 46,300 cubic meters per capita and Central America is in between, with 8,200 cubic meters per capita. Across individual countries, lower density tends to go with more adequate water resources (which is not necessarily the case in Africa and Asia). The three countries with the lowest population density also have the best per capita water availability. At the other end, the four countries with the least adequate water resources in 2005, all below the water scarcity level, are all in the Caribbean: the Bahamas, Barbados (also the country with the highest population density), St. Kitts and Nevis and Antigua and Barbuda (table I.9). Just after these four comes Haiti, which is also among the most densely populated and, given its development status and prospects, possibly the most threatened. If water supplies in Haiti are not augmented, per capita availability will fall by more than a third by 2050, into the scarcity zone.

[2] An even smaller territory in South America, the Falkland Islands or Malvinas, is even less densely populated, but is not considered here because its population in 2007 was less than 100,000.

El Salvador and Mexico are also among the top ten in limited water availability and levels will fall somewhat, but stay comfortably above water stress level.

4. Oceania

Oceania has three countries larger than 4 million: Australia, with 20.3 million in 2005; Papua New Guinea, with 6.1 million; and New Zealand, with 4.1 million (table I.6). Every other country has fewer than 1 million people. The three largest countries account for 90 per cent of the population in 2005. The largest part of the remaining population—1.7 million—is in Melanesia, which also includes Papua New Guinea. The other two regions, which spread east into the distant reaches of the Pacific, are Micronesia, with 538,000 people and Polynesia, with 645,000.

The large differences in scale should be kept in mind in examining trends among the regions of Oceania (figure I.16). In the last decade, growth has been strongest in Melanesia and is projected to remain stronger than in Micronesia or Polynesia. Growth rates in Australia and New Zealand will be roughly as low as in Polynesia, though not falling as much toward the end of the projection. Australia and New Zealand will account for more than half of the population increment in Oceania to 2050. The contribution of Papua New Guinea and other Melanesian countries, especially Vanuatu and the Solomon Islands, will still be notable (table I.7).

Population densities are variable (table 1.5 and table 1.8), particularly low in Australia at 3 persons per sq. km., a little higher in Melanesia (where Papua New Guinea has 13 persons per sq. km.), still higher on average in Polynesia and highest in Micronesia (where Nauru has 481 persons per sq. km). By 2050, densities are projected to double in Vanuatu and the Solomon Islands and to rise strongly also in Papua New Guinea. The Northern Mariana Islands and American Samoa, in Micronesia and Polynesia respectively, should see densities increase 70 per cent to 90 per cent. Each is associated with the United States, as a commonwealth and a territory respectively. All other countries should see less change. Statistics on water are missing for too many countries to permit comments.

5. Europe

The European regions face different demographic prospects from other regions: negative growth especially toward the east but overall relative demographic stability. Eastern Europe, which includes the Russian Federation and therefore a large chunk of territory that is actually on the Asian continent, is the center of gravity for population with 81 per cent of the total in 2005 (table I.4) Western Europe counts for. 26 per cent, Southern Europe for 21 per cent and Northern Europe for 13 per cent Eight countries had populations over 35 million (figure I.17) and all the rest were smaller than 25 million.

The population of Eastern Europe is declining and is projected to continue to do so (figure I.18). The decline started around 1990, grew sharper in that decade and is still accelerating, though more slowly, as it is projected to continue to do. The growth rate is estimated at -0.5 per cent annually for 2000-2005 and will fall close to -0.8 per cent by 2050 (table I.4). The other three regions had positive growth rates in 2000-2005 of 0.3 per cent to 0.6 per cent, which represent a slight rise in rates after irregular, long-term decline. The rise was greatest in Southern Europe, which is nevertheless projected to decline fastest, reaching zero growth in 2015 and negative growth close to –0.3 per cent by 2050. Zero growth is delayed in Western Europe to 2030 and in Northern Europe beyond the projection period. Given past fluctuations in growth rates, these dates are approximations and much fluctuation around the smooth projected paths in figure I.18 can be expected.

The European countries with strongest growth in 2000-2005 are Ireland (1.8 per cent annually), Spain (1.5 per cent) and Iceland (1.0 per cent). These rates are far below the highest in other major world areas but in the range of typical rates in less developed regions (table I.7). The elevation of the rates may be temporary. Long-term growth is projected to be much slower: in Spain, for instance, only 0.15 per cent annually from 2005 to 2050. In fact, for Bosnia and Herzegovina, the sixth highest growth rate in Europe in 2000-2005 is projected to turn into the eighth lowest rate for 2005-2050. Unsettled conditions in this

Figure I.16. Annual growth rates in Oceania, 2005-2050

Figure I.17. Population in European regions and all their countries larger than 25 million in 2005

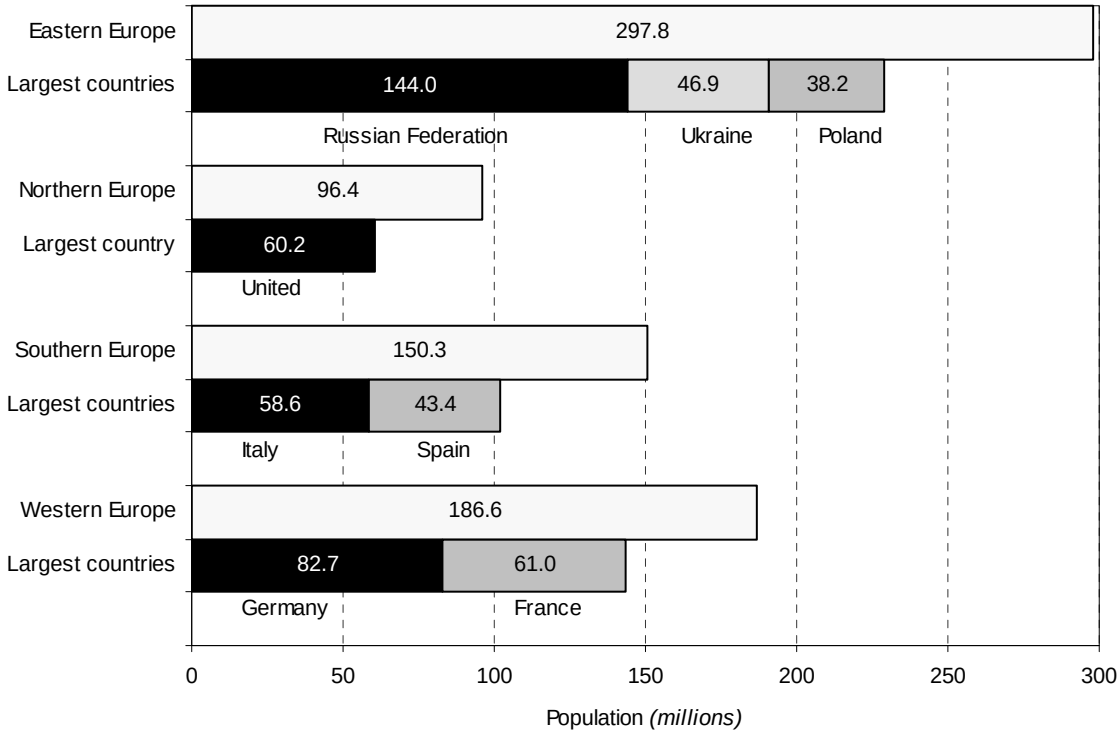
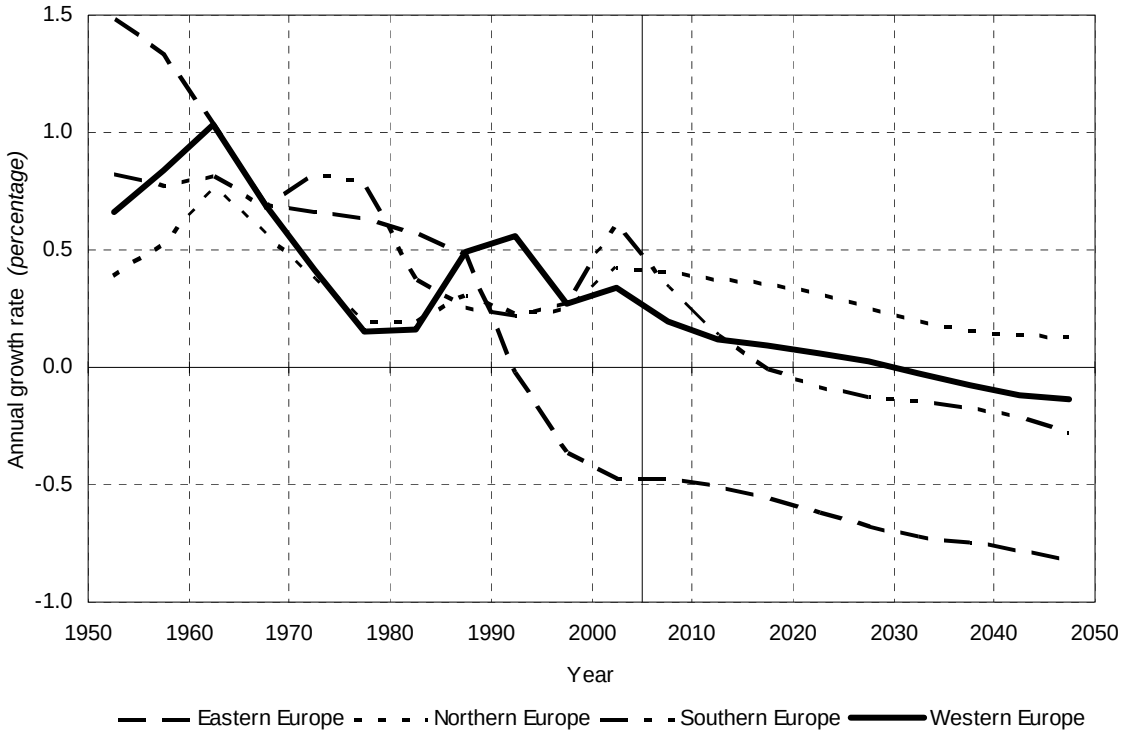


Figure I.18. Annual growth rates in European regions, 2005-2050



and other parts of the Balkans have led to growth rates that are unusually elevated or depressed and not expected to persist as such.

No country in Eastern Europe is among those with the fastest growth, or even in the top half of countries ranked by growth rates. Instead, Eastern European countries, together with other formerly Communist countries, dominate the list of those with the slowest growth. For 2000-2005, Montenegro had a negative growth rate of –1.9 per cent annually and Moldova a growth rate of -1.3 per cent. In Montenegro, however, long-term rates for 2005-2050 are close to zero, as they are in Serbia, which is also among those with the lowest recent rates (table I.7). These cases further illustrate the current volatility of growth in the Balkans.

Over the long run, to mid-century, 24 countries will lose population and 16 will gain population. The largest loss by far over the period will be in the Russian Federation (36.1 million). The largest gains will be in the United Kingdom (8.5 million) and France (7.3 million).

Population density is lowest in Eastern Europe, at 16 persons per sq. km. (table 1.5 and table 1.8), largely because of the vastness of Siberia, which makes up 77 per cent of the territory of the Russian Federation. Excluding the Russian Federation, population density in Eastern Europe is 88 persons per sq. km., higher than in Northern Europe (53 persons per sq. km.) but still below Southern Europe (114 persons per sq. km.) and Western Europe (168 persons per sq. km.). Population density will decline in Eastern Europe (excluding the Russian Federation) to 66 persons per sq. km. by 2050. Changes in the other regions will be minor.

The countries with the highest population density will not see more than minor changes. Malta, the Channel Islands, the Netherlands and Belgium had the highest population densities in 2005 and none of them will see a change in population density greater than 6 per cent (table I.8). The least densely populated counties, with no more than 20 persons per sq. km., are the Russian Federation and the Scandinavian countries, except for Denmark. They will also see little change in population density.

Water availability is precarious in Malta, where only 166 cubic meters per capita of renewable fresh water are available (table I.9). The Czech Republic, Italy and Poland each have between 1,500 and 1,650 cubic meters per capita, at water stress levels. With projected population decline, the situation should improve just enough, even without augmented water supplies, to move each of these countries above 1,700 cubic meters per capita by 2050.

II. POPULATION AGEING

As the world population grows, it grows greyer. The median age of the world population was, on average, 28.0 years in 2005, having climbed 4.3 years since 1985. It is projected to climb further, to 32.7 years in 2025 and to 38.6 in 2050. The number of people aged 65 and over is now 7.3 per cent of the world population and is poised to exceed the number of people under age five in a little more than a decade. Two decades later, those aged 65 and over will be twice as numerous as those under age five.

Population ageing and, more generally, the dynamics of changing age structures have many consequences, economic and social, political and cultural. This chapter examines the changing age structure globally, across major areas of the world, within regions and for some countries. Three broad age groups are considered: Children (aged 0 to 14), the population in the main working ages (aged 15 to 64) and older persons (aged 65 and over).

A. GLOBAL LEVELS AND TRENDS

Median age around the world was falling until 1970, when it reached a low, for the last half century, of 22 years. It started to rise at that point and the rise has accelerated. In over a decade median age rose by one year. In the 1980s, the rise was about one year and a half and in the 1990s more than two years. Going forward, the rise is projected to average a little over two years per decade (table II.1).

Median age varies substantially by development group. In more developed regions, the 2005 median was 38.6 years in 2005, in the least developed countries 19.0 and in other less developed countries 26.6 (figure II.1). The median has been rising about equally fast in more developed regions and less developed regions. Going forward, the 12-year gap between more developed and less developed regions excluding the least developed countries (i.e., other less developed countries) will close slightly. The smaller gap of 7.6 years between least developed countries and other less developed countries, by contrast, will increase. The least developed countries will not reach the current median age in other less developed countries until 2045.

Levels and trends in three major world areas closely track those in one of the development groups (figure II.2). One of the exceptions is Northern America, where median age was 36.3 years in 2005, 2.3 years younger than the average for more developed regions and rising more slowly. The other exception is Oceania, which was about at the level of more developed regions back in 1950, was halfway between more developed regions and less developed regions excluding the least developed countries (i.e., other less developed countries) by 2005 and will be at the level of other less developed countries in 2050.

The medians reflect the changing age distribution, shown in figure II.3 for the major world areas for four separate years from 1985 to 2050 (table II.2). The sharpest contrasts among the distributions are between Africa in 1985 and Europe at different points in the projected future. Across the major areas in the years shown, children and youth aged 0-14 were as numerous as 45 per cent of the population in Africa in 1985 and will be as few as 15 per cent of the population in Europe by 2050. Those in the main working ages, conventionally defined as 15-64 years, ranged from 52 per cent of the population (in Africa in 1985) to 68 per cent (in Europe in 2025). Older persons aged 65 and over were only 3 per cent of the population in Africa in 1985 and will be 28 per cent in Europe by 2050. As population ages, the proportional share of children and youth falls and the share of older persons rises, while the share of the vast middle may rise or fall—generally rising first, as births decline and then falling, as large birth cohorts age and life expectancy rises. Each age group deserves separate consideration.

TABLE II.1. MEDIAN AGE FOR THE WORLD BY DEVELOPMENT GROUP, AND MAJOR AREA, SELECTED YEARS

Development group or major area	*1950*	*1985*	*2005*	*2025*	*2050*
World	23.9	23.7	28.0	32.7	38.1
More developed regions	29.0	33.2	38.6	43.0	45.7
Less developed regions	21.5	20.9	25.5	30.8	36.9
Least developed countries	19.5	17.7	19.0	22.1	27.9
Other less developed countries	21.8	21.4	26.6	32.7	39.4
Africa	19.1	17.4	19.0	22.1	28.0
Asia	22.2	22.2	27.6	33.6	40.2
Europe	29.7	33.7	38.9	44.2	47.3
Latin America and the Caribbean	20.0	20.9	26.0	32.5	40.1
Northern America	29.8	31.4	36.3	38.7	41.5
Oceania	28.0	27.7	32.3	36.2	40.0

Figure II.1. Median age for the world and development groups, 1950-2050

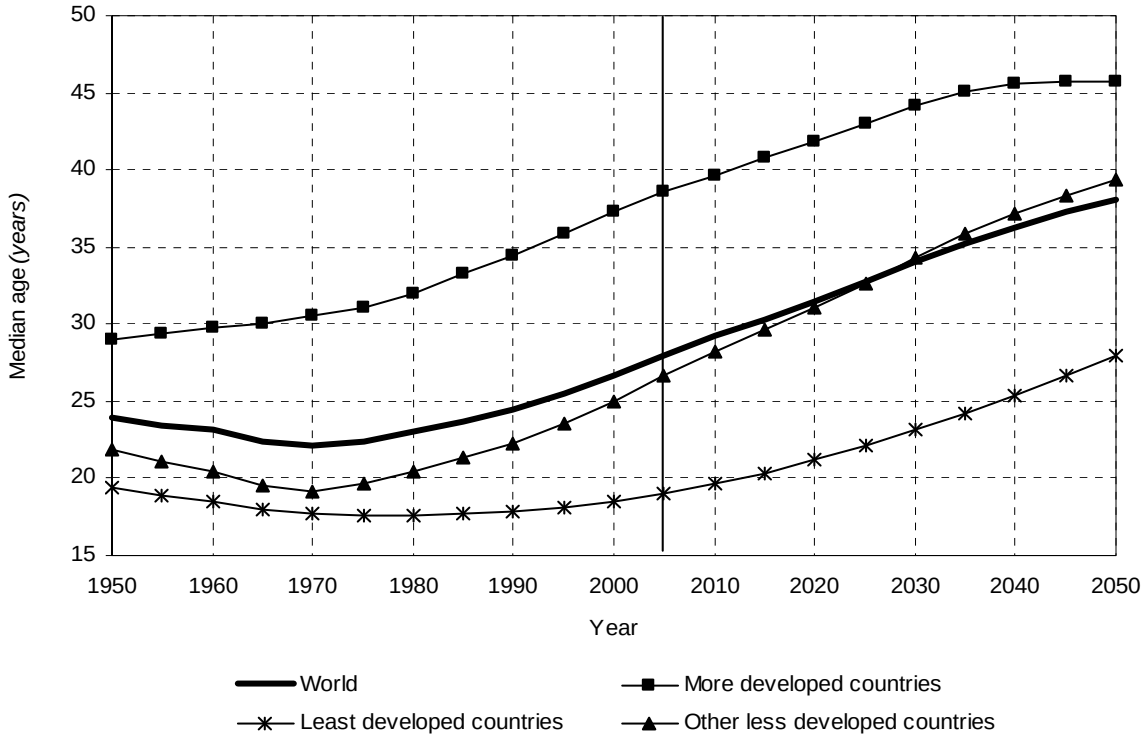


Figure II.2. Median age for development groups and major areas, 1950-2050

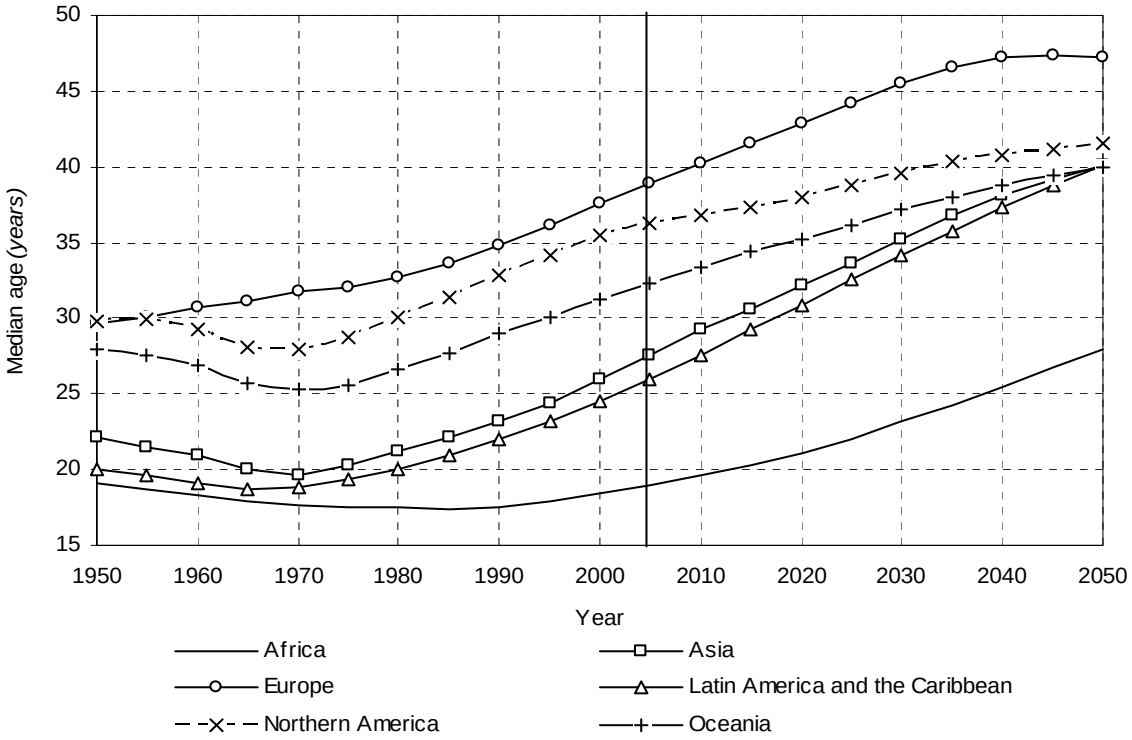


Figure II.3. Population composition by broad age group for major world areas, 1985, 2005, 2025 and 2050

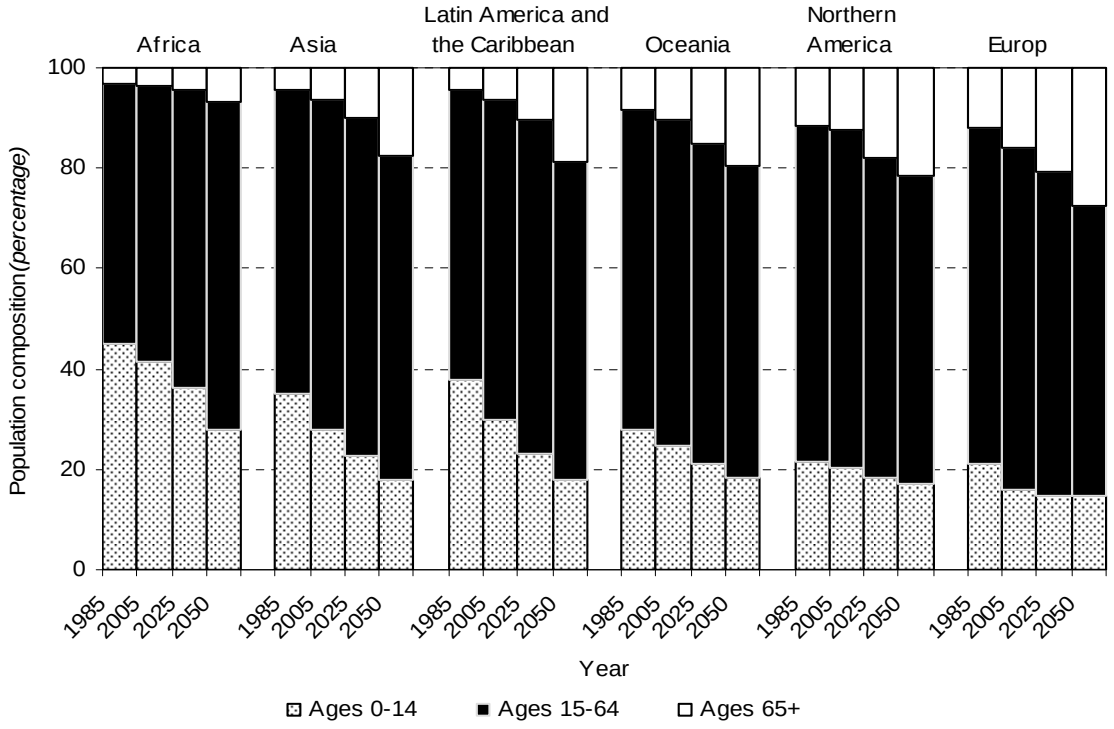


TABLE II.2. POPULATION IN BROAD AGE GROUPS FOR THE WORLD BY DEVELOPMENT GROUP, MAJOR AREA AND REGION, 2005, 2025 AND 2050
(percentage of total population)

Development group or major area and region	*0-14*			*15-64*			*65 and over*		
	2005	*2025*	*2050*	*2005*	*2025*	*2050*	*2005*	*2025*	*2050*
World	**28.3**	**24.1**	**19.8**	**64.4**	**65.4**	**63.9**	**7.3**	**10.5**	**16.2**
More developed regions	17.0	15.6	15.2	67.7	63.7	58.6	15.3	20.7	26.1
Less developed regions	30.9	25.7	20.6	63.6	65.8	64.7	5.5	8.6	14.7
Least developed countries	41.5	36.5	28.2	55.2	59.4	64.9	3.3	4.1	6.9
Other less developed countries	29.1	23.4	18.4	65.0	67.1	64.7	5.9	9.5	16.9
Africa	**41.4**	**36.3**	**28.0**	**55.2**	**59.5**	**65.1**	**3.4**	**4.2**	**6.9**
Eastern Africa	44.4	38.8	29.3	52.7	57.8	65.2	2.9	3.4	5.6
Middle Africa	45.6	42.7	32.7	51.5	54.5	63.0	2.9	2.9	4.3
Northern Africa	33.1	27.0	20.6	62.2	65.9	65.5	4.6	7.1	13.9
Southern Africa	32.9	28.3	22.8	62.9	64.9	67.9	4.2	6.7	9.2
Western Africa	43.9	37.5	28.4	53.0	58.9	65.5	3.1	3.6	6.0
Asia	**28.0**	**22.6**	**18.0**	**65.6**	**67.3**	**64.5**	**6.4**	**10.1**	**17.5**
Eastern Asia	20.9	17.3	14.9	70.4	67.7	60.3	8.8	15.0	24.8
South-Central Asia	33.6	26.0	19.5	61.8	66.8	67.0	4.7	7.2	13.5
South-Eastern Asia	29.3	22.5	17.9	65.2	68.4	64.5	5.4	9.1	17.6
Western Asia	33.1	27.0	20.9	62.3	66.4	65.7	4.6	6.7	13.4
Europe	**15.9**	**14.7**	**14.6**	**68.2**	**64.6**	**57.9**	**15.9**	**20.7**	**27.6**
Eastern Europe	15.3	14.3	13.8	70.4	67.1	59.5	14.2	18.6	26.6
Northern Europe	18.0	17.0	16.1	66.2	62.8	59.6	15.8	20.1	24.2
Southern Europe	15.1	13.7	14.0	67.4	64.1	54.6	17.6	22.2	31.4
Western Europe	16.3	14.8	14.9	66.4	62.4	57.4	17.2	22.9	27.7
Latin America and the Caribbean	**29.8**	**23.1**	**18.0**	**63.9**	**66.6**	**63.5**	**6.3**	**10.3**	**18.5**
Caribbean	28.4	23.3	18.6	63.8	65.1	62.5	7.8	11.6	18.9
Central America	32.6	24.0	18.0	61.8	66.6	63.6	5.5	9.4	18.4
South America	28.9	22.8	17.9	64.7	66.7	63.6	6.4	10.5	18.5
Northern America	**20.5**	**18.5**	**17.1**	**67.2**	**63.4**	**61.4**	**12.3**	**18.1**	**21.5**
Oceania	**24.9**	**21.3**	**18.4**	**64.8**	**63.6**	**62.2**	**10.3**	**15.1**	**19.4**
Australia/New Zealand	19.8	17.6	16.3	67.2	62.9	59.4	12.9	19.4	24.3
Melanesia	39.4	30.6	23.3	57.9	65.1	68.5	2.7	4.3	8.3
Micronesia	32.1	25.5	19.8	63.7	66.5	66.6	4.3	8.0	13.7
Polynesia	34.1	26.1	19.6	60.7	65.8	65.8	5.2	8.1	14.6

B. CHILDREN

In 2005, children[1] aged 0-14 were 43 per cent to 44 per cent of the population in each of the three tropical regions of sub-Saharan Africa (Eastern, Middle and Western Africa), but only 15 per cent to 20 per cent of the population in each European region, in Australia/New Zealand and in Northern America (table II.2). In these more developed regions, the proportions have been lower than in other regions at least since 1950. As the proportions fall in the next half century, they will stay lower in the more developed regions. The rankings of other regions will stay mostly the same, with the main exception being Southern Africa, where the decline will be less than average. By 2050, the proportions will still be at 28 per cent to 33 per cent in tropical regions of sub-Saharan Africa, well above current proportions in more developed regions.

[1] This report uses the age group 0 to 14 to delineate children as a demographic group, following established practice. In contrast, the United Nations Convention on the Rights of the Child defines children generally as any human being under the age of eighteen (General Assembly resolution 44/25, November 1989).

BOX II.1. DEMOGRAPHIC CHANGES AND AGE STRUCTURE

Changes in population growth rate, size and age structure are intrinsically related to changes in fertility, mortality and migration.

Fertility declines have the effect of reducing the proportion of children and, on balance, raising the proportion of adults and older persons. Thus fertility decline is often associated with population ageing.

Mortality The influence of mortality decline is more complex and is dependent on the stage of mortality transition. The initial stage of mortality decline is one in which mortality risks in infancy and childhood tend to fall more, in proportional terms, than do risks for working-age adults and older persons. Declines in risk of dying at ages 0-5 exert an influence much like that of fertility increases: they tend to raise the population rate of growth and increase the proportion of children in the population. In this way, the initial stages of mortality decline have the seemingly paradoxical effect of making the population as a whole grow younger, even as the probabilities of survival to the middle and older ages increase. Later, as levels of life expectancy approach and surpass 70 years, the continuation of mortality decline increasingly takes the form of reductions in mortality risks for older people. These changes tend to increase the proportion of older persons in the population as a whole.

International migration has a comparatively weak influence on the overall population growth of a given country, though in some cases it does exert important effects on age structure.

The highest proportion for any country in 2005 was 49 per cent in Uganda and the lowest was 14 per cent in Bulgaria. In the past half-century, only slightly higher proportions have been seen than in Uganda: 52 per cent in Yemen in 1990, 51 per cent in Rwanda in 1995. The low proportion in Bulgaria is the lowest recorded since 1950 and the next four lowest proportions in 2005 (in Japan, Italy, Slovenia and Greece) are also lower than any other national proportion recorded in the last half-century (details not shown).

In the next half-century, the proportion is expected to fall in every country without exception: by 13 percentage points on average in least developed countries, 11 points on average in other less developed countries and 2 points on average in more developed regions (table II.2). Absolute numbers of children aged 0-14 will fall in many cases, but not in the least developed countries. Though their share of the population will decline, their numbers will increase by more than half from 2005 to 2050. Even age groups that lose share can grow as other groups grow faster (figure II.4).

In the two countries where the population aged 0-14 is projected to grow fastest, Niger and Burundi, the size of this age group will triple from 2005 to 2050, although the group's share of total population will fall from 48 per cent to 37 per cent in Niger and from 45 per cent to 38 per cent in Burundi in the same period (figure II.5). At the other extreme, Guyana and the U.S. Virgin Islands will see this age group reduced by 71 per cent and 54 per cent respectively. Yet, the group's share of the total population will fall, from 24 per cent to 31 per cent in 2005, to 14 per cent to 15 per cent in 2050.

Considering the consequences of changes of this magnitude for societies and economies goes beyond the demographic focus of this report. One can, however, look at one small aspect of this, the demographic consequences for primary schools. The official age for attending primary school varies, but if one assumes a fixed age of 6-11, some comparisons can be made across countries.

Figure II.4. Population aged 0-14: number and proportion of the total population, by development group, 1950-2050

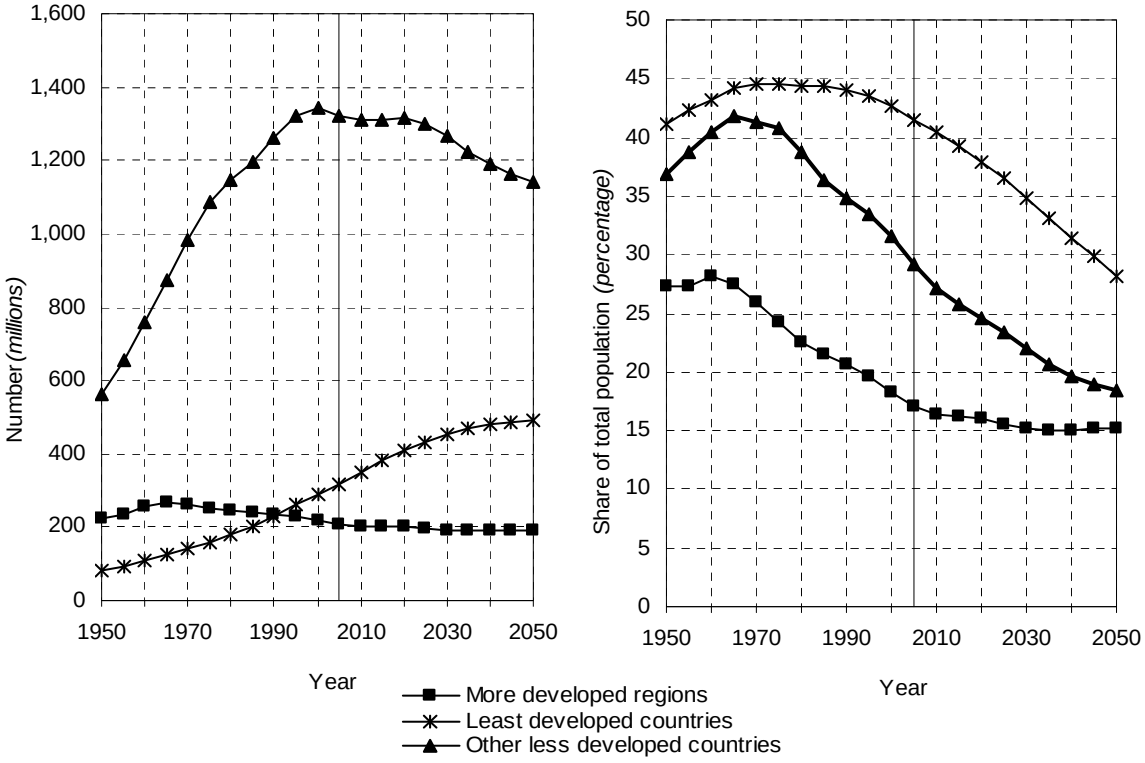
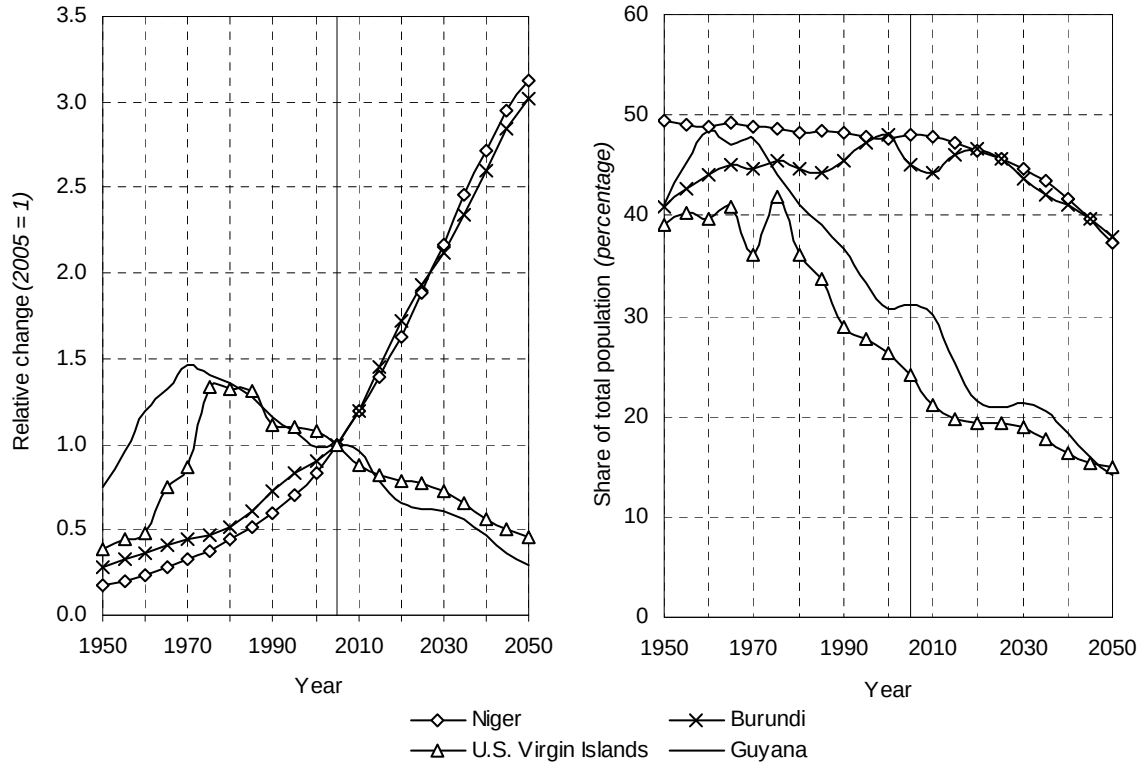
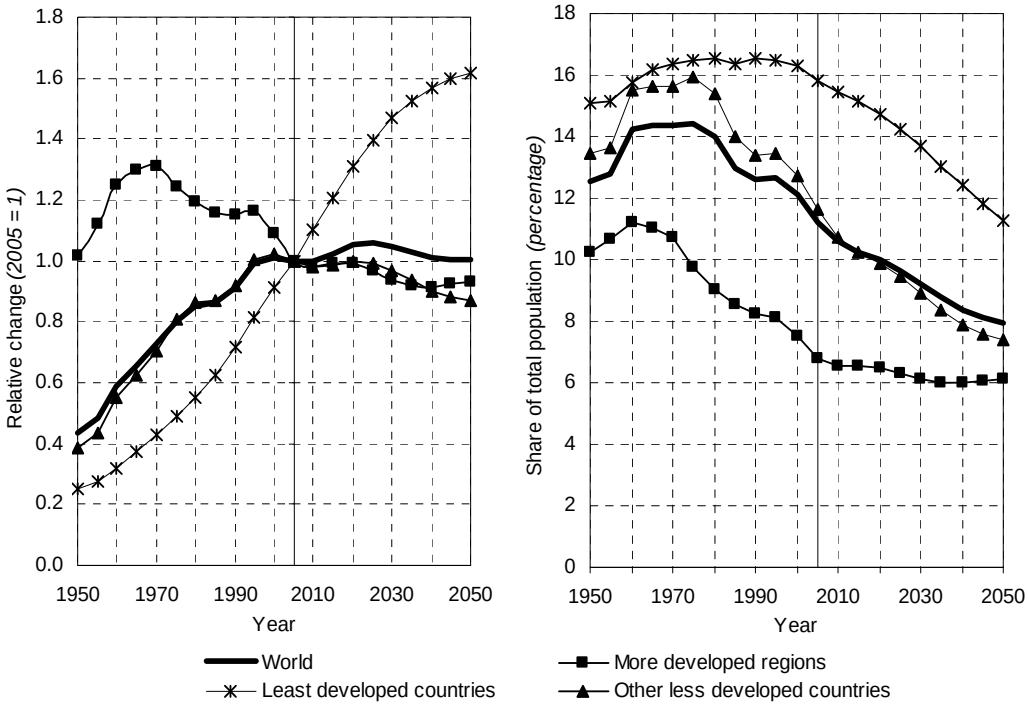


Figure II.5. Change in the population aged 0-14 relative to 2005 and its share of the total population: countries with the most and least relative change, 1950-2050



In 2005, there were 731 million children aged 6-11 worldwide, in 2015 there will be 748 million and by 2025 the number will peak at 774 million (figure II.6). To enrol every child in primary school by 2015, one would apparently have to add 17 million students in the aggregate, in addition to the number currently not enrolled. This estimate is misleading, however, because a number of countries will lose population in this age group. China alone will lose 16 million between 2005 and 2015¸ and 99 other countries will lose a total of 10 million. Since primary school students are rarely internationally mobile, such losses cannot offset by increases elsewhere. A better estimate, therefore, is 44 million students to add from 2005 to 2015, in addition to the numbers not currently enrolled in countries where this age group will increase. This implies an overall increase of 6 per cent, or 9 per cent if the base is just those countries with increases. Over a decade, such figures should be manageable.

Figure II.6. Change in population aged 6-11 relative to 2005 and its share of the total population for the world and development groups, 1950-2050



However, taking into account the proportions currently not enrolled and looking at the situation country-by-country turns up problems. The increase in the age group 6-11 from 2005 to 2015 is as high as 52 per cent (in Liberia). The net enrolment rate[2] is as low as 33 per cent (in Djibouti). Combining these two types of figures gives 14 countries (and potentially more, given the countries without proper enrolment data) where students in this age group would have to at least double from 2005 to 2015 to reach full enrolment (table II.3). Except for Sudan, none of these countries are in Northern or Southern Africa; all are in tropical regions of sub-Saharan Africa. Under enrolment accounts on average for two-thirds of the needed increase, population change for one-third.

[2] The net enrollment rate excludes primary school age students who are overage or underage for that level. Whether primary school age children who are enrolled at a different level are counted, as they should be, is not always clear. In any case, this group is likely to be quite small. Data were obtained on-line from UNESCO (2007), using estimates for 2005, or where these are missing for the latest year between 2000 and 2004. Still, 33 countries were without data, including such countries with probably low enrollment as Afghanistan, Angola, the Democratic Republic of the Congo, Sierra Leone, Somalia and Uganda.

TABLE II.3. COUNTRIES WHERE PRIMARY SCHOOL ENROLLMENT MUST AT LEAST DOUBLE FROM 2005 TO 2015 TO REACH FULL ENROLLMENT

	Population aged 6-11 (thousands)			*Percentage increase needed for full enrolment*		
Country	*Enrolled in 2005*	*Not enrolled in 2005*	*Increase in total, 2005-2015*	*Due to under-enrolment*	*Due to population increase*	*Total*
Niger	971	1 351	984	139	101	240
Burkina Faso	950	1 447	709	152	75	227
Djibouti	40	82	4	205	9	214
Guinea-Bissau	125	152	109	121	88	209
Eritrea	345	369	320	107	93	200
Sudan	2 419	3 459	657	143	27	170
Burundi	721	586	577	81	80	161
Ethiopia	6 129	7 341	2 463	120	40	160
Mali	1 119	959	666	86	60	145
Congo	303	270	133	89	44	133
Liberia	390	199	307	51	79	130
Chad	1 042	688	567	66	54	120
Comoros	71	58	26	82	37	118
Côte d'Ivoire	1 644	1 349	309	82	19	101

Of 10 additional countries where the required increase in students would exceed 70 per cent, two lie outside sub-Saharan Africa: Timor-Leste and the Solomon Islands. Achieving an increase of 70 per cent over 10 years would require annual growth in enrolment of 5.5 per cent. In this second tier of countries facing serious challenges of school expansion, population change accounts for a larger proportion of the needed increase, 42 per cent.

At the end of the scale, countries losing primary school age population presumably will have to make adjustments, but the changes are considerably more moderate. China's loss of 16 million over a decade translates into a 14 per cent decline in this population. The largest percentage decline will be in Singapore, at 35 per cent. The five other countries losing more than a quarter of their primary school age population by 2015 are, in order: Macao SAR China, the Republic of Korea, Grenada, Bosnia and Herzegovina and the Democratic People's Republic of Korea.

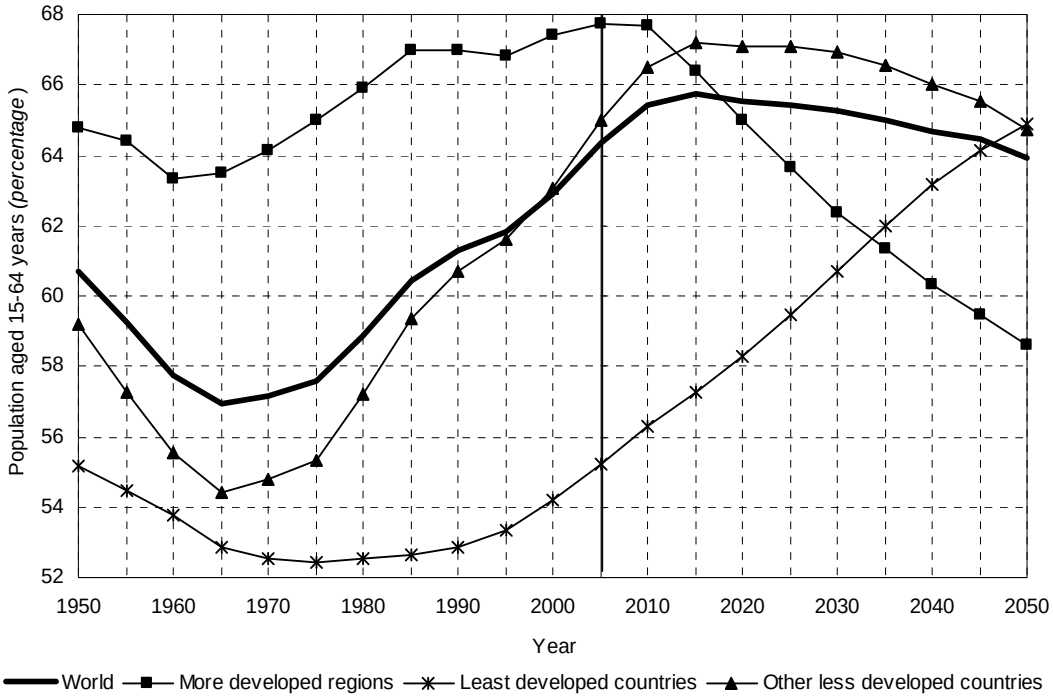
C. THE BROAD MIDDLE: POPULATION IN THE MAIN WORKING AGES

Between youth and the age group of older persons age, the large group conventionally de-delimited by the ages 15 and 64 generally makes up half or more of the population. They play many of the crucial roles in society, especially in production and reproduction and it is in their productive capacity that they are mainly addressed here.

Those aged 15-64 were 64 per cent worldwide in 2005, but only 55 per cent in the least developed countries and as high as 68 per cent in more developed regions (table II.2 and figure II.7). In less developed regions excluding the least developed countries (i.e., other less developed countries), the proportion in this age group in 1965 was about the same as for least developed countries, but has been rising relatively fast. A little after 2010, it should reach the same level as in more developed regions and then begin to fall.

To attach some meaning to these proportions, demographers calculate the dependency ratio, the ratio of the population excluded from this group (multiplied by 100) to the population included. This represents the number of younger and older dependents, presumably not working, to every 100 working age adults in the society. The ratio is essentially the inverse of the proportion at ages 15-64. With this indicator, the contrast between more developed regions and the least developed

Figure II.7. Proportion of the population aged 15-64 for the world and by development group, 1950-2050



countries looks even more impressive (table II.4, figure II.8 and figure II.9). With 48 dependents per 100 persons in the main working ages in 2005, the more developed regions are much better positioned in 2005 than the least developed countries, with 81. Trends in dependency ratios in major world areas tend to be similar to those in one or the other development groups, except for Northern America and Oceania, which are generally intermediate between development groups.

The highest dependency ratios in 2005, of over 100, were in sub-Saharan Africa: in Uganda, Mali, Niger, Guinea-Bissau and Malawi. None of these countries will be in the top five by 2050. In fact, none of the top 25 in 2005 will be in the top 25 by 2050. Rankings will be largely turned around, though with almost as high dependency ratios at the top as the highest in 2005. Japan and Spain will be highest, with over 90 dependents per 100 workers in each case.

Dependency matters because a large cohort of persons in the main working ages and relatively few dependents can provide a society with a demographic bonus, a period during which the ratio of producer to consumers can rise and thus - it can produce more and consume less. Whether such a bonus is translated into greater economic welfare depends on nondemographic factors, but the window during which the bonus is available is defined by the interplay of births and deaths (with a possible small help from migrants) and the process of ageing. The window eventually does close. Indeed, overall old-age dependency is rising in more developed regions with longer survival and birth rates that began to sink as long as half a century previously. By 2035, dependency will be as high in more developed regions as in the least developed countries.

How long the demographic bonus remains available depends largely on how it is defined. A report on the 2004 Revision (United Nations, 2004b) suggested that the demographic window might be considered to open when the population aged 0-14 falls below 30 per cent of the total and end when the population 65 year and older rises past 15 per cent. These criteria can be applied fairly consistently across countries.

TABLE II.4. DEPENDENCY RATIO FOR THE WORLD BY DEVELOPMENT GROUP, AND MAJOR AREA, SELECTED YEARS

(persons under age 15 or 65 and over per 100 persons aged 15-64)

Development group or major area	*1950*	*1985*	*2005*	*2025*	*2050*
World	64.8	65.4	55.4	52.8	56.5
More developed regions	54.4	49.3	47.7	57.1	70.6
Less developed regions	70.2	70.9	57.3	52.1	54.4
Least developed countries	81.3	90.0	81.1	68.2	54.1
Other less developed countries	68.9	68.5	53.9	49.0	54.6
Africa	82.0	92.8	81.2	68.2	53.6
Asia	67.5	65.7	52.4	48.5	55.0
Europe	52.4	49.6	46.6	54.9	72.8
Latin America and the Caribbean	77.7	74.0	56.5	50.2	57.4
Northern America	54.9	49.6	48.9	57.8	62.8
Oceania	59.2	57.2	54.2	57.2	60.7

Figure II.8. Dependency ratio by development group, 1950-2050

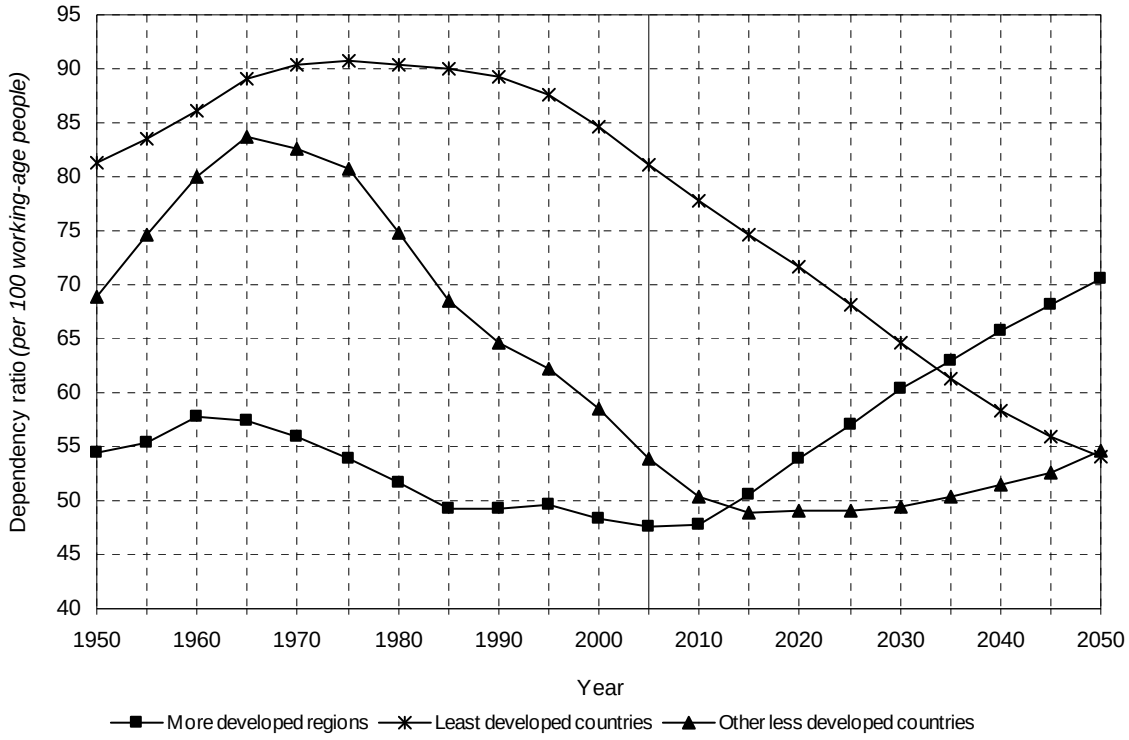
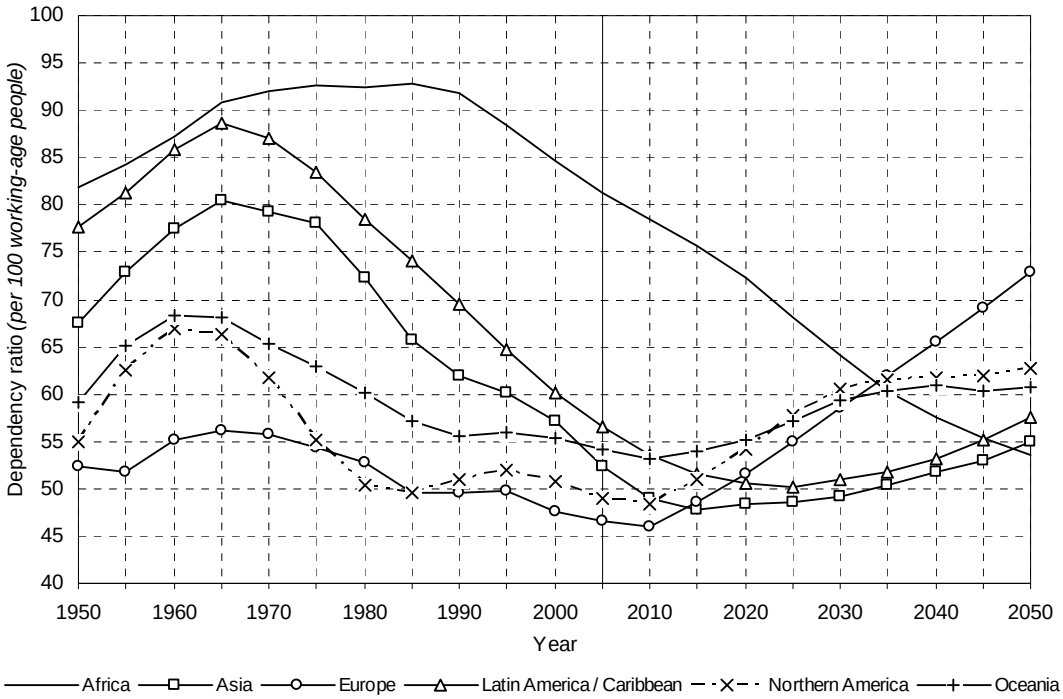


Figure II.9. Dependency ratio by major area, 1950-2050



Applied to development groups, the criteria suggest that the demographic window for more developed regions as a whole was open in 1950, when those aged 0-14 were 27 per cent of the population and closed just after the turn of the century, with those aged 65 and older reaching 15 per cent. The window for other less developed countries as a group is just opening and will stay open to 2040. The window for least developed countries will not open till 2045. The timing for major world areas resembles that for particular development groups, again with the exceptions of Northern America and Oceania (figure II.10).

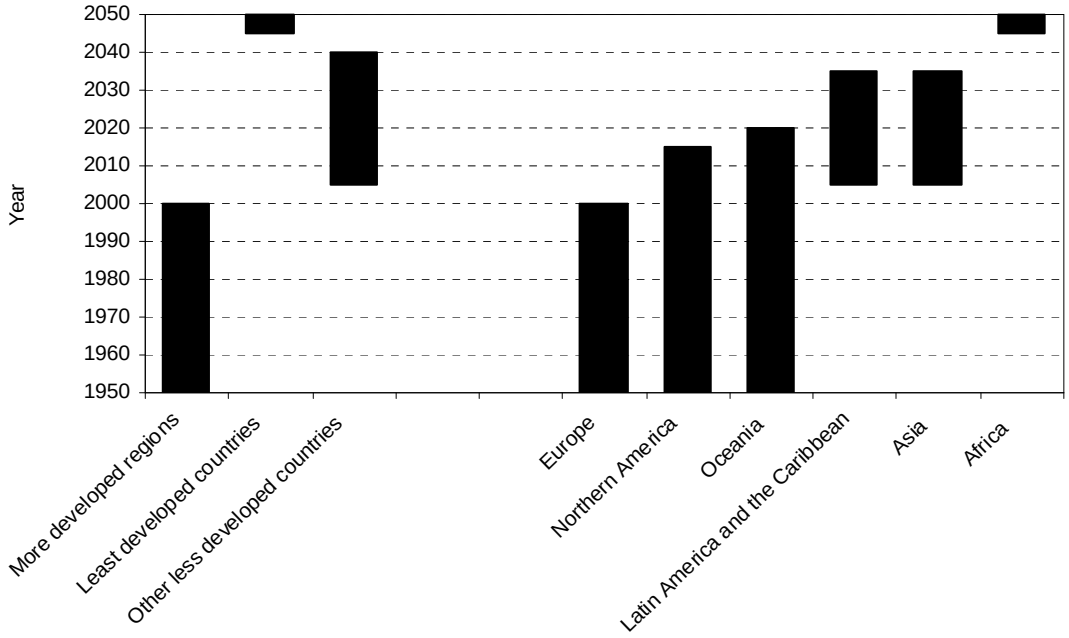
There is a clear pattern by regions, with all the more developed regions either past their demographic windows or near closure (figure II.11). Eastern Asia is in the middle of the period, the regions of Latin America and the Caribbean either starting or soon to start and the African regions likely to have a much delayed start. Middle Africa will still have 33 per cent of its population under age 15 by the year 2050.

To benefit from the demographic bonus, the broad middle cohorts will have to be gainfully employed. It is worth examining therefore the absolute size of this group. Figure II.12 shows how the age group will increase in each major area from 2005 to 2020. It also shows for comparison the growth in total populations and in the economically active population. The latter figures come from combining population estimates with estimates over time of the proportion of males and females economically active, whether employed or unemployed[3] (table II.5).

From 2005 to 2020, the age group 15-64 will grow 45 per cent in Africa. This is effectively an annual growth rate of 2.5 per cent, slightly higher than the growth rate for the population as a whole. The economically active population is expected to increase slightly faster, by 47 per cent. Asia and Oceania show smaller percentage increases in the economically active population, increases close to those expected for the entire age group 15-64. Only Europe is projected to show a decline in the economically active population, but no more than a 4 per cent decline over 15 years.

[3] The International Labour Organization/Office (2007) estimates and projects these proportions by sex up to the year 2020 for the entire age group 15 years and older.

Figure II.10. Estimated window for the demographic bonus, by development group and major area



Note: A possible demographic window might be considered to open when the population aged 0-14 falls below 30 per cent of the total and end when the population 65 year and older rises past 15 per cent (United Nations, 2004b).

Figure II.11. Estimated window for the demographic bonus, by region

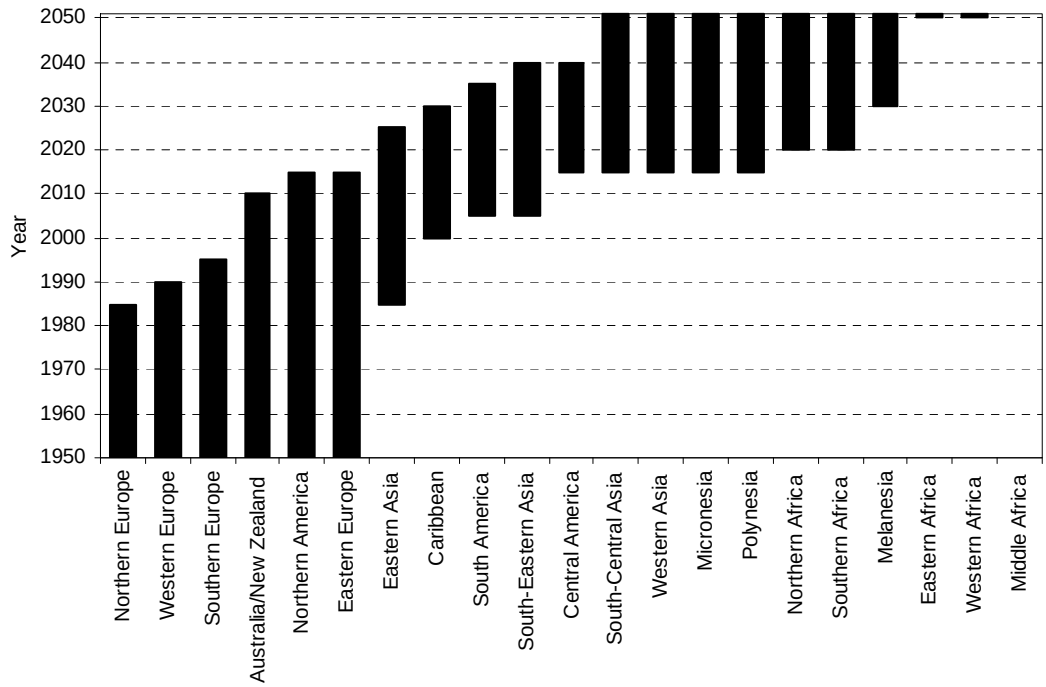


Figure II.12. Percentage change of population in the main working ages, economically active population and total population, by major area in 2005-2020

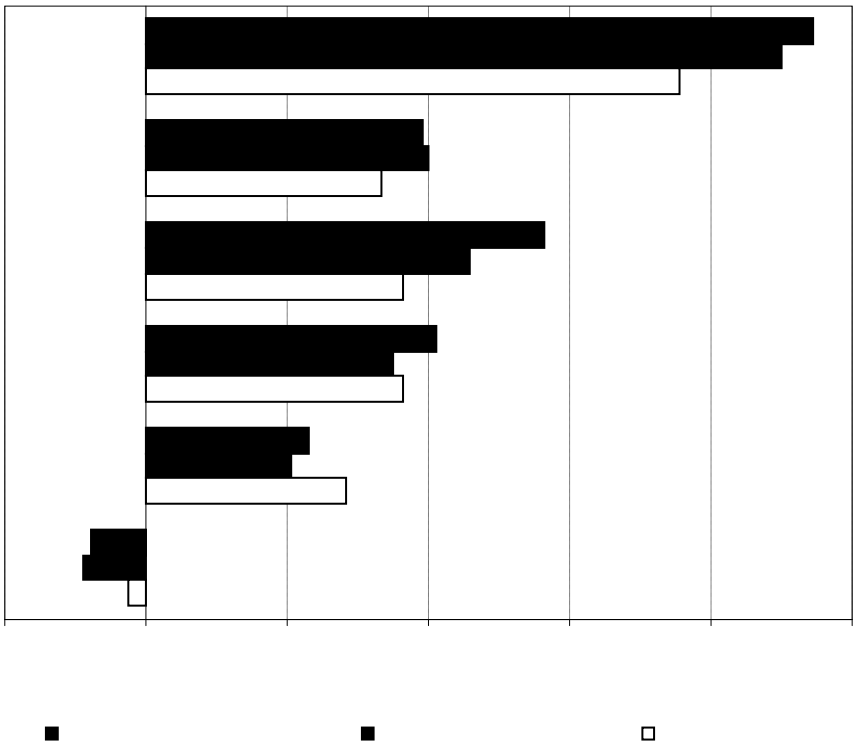


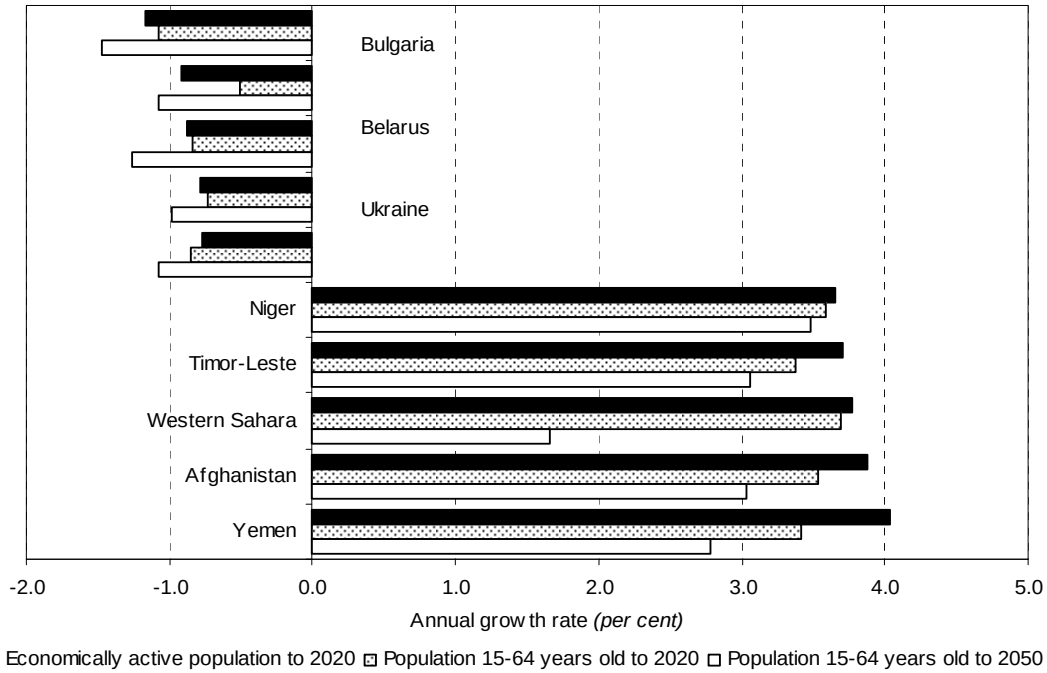
TABLE II.5. POPULATION AGED 15-64 AND POPULATION IN THE LABOUR FORCE FOR THE WORLD, BY DEVELOPMENT GROUP, AND COUNTRIES WITH THE LOWEST AND HIGHEST PROJECTED GROWTH RATES, 2005, 2020, 2050

	Population (millions)					*Annual growth rate (percentage)*		
	Aged 15-64			*Economically active*		*Economically active*	*Population aged 15-64*	
Development group or country	*2005*	*2020*	*2050*	*2005*	*2020*	*2005-2020*	*2005-2020*	*2005-2050*
World	4 192.4	5 022.7	5 874.9	…	…	…	1.20	0.75
More developed regions	823.2	815.0	729.9	…	…	…	-0.07	-0.27
Less developed regions	3 369.2	4 207.6	5 144.9	…	…	…	1.48	0.94
Least developed countries	423.5	626.5	1 130.7	…	…	…	2.61	2.18
Other less developed countries	2 945.7	3 581.1	4 014.2	…	…	…	1.30	0.69
Bulgaria	5.3	4.5	2.8	3.1	2.6	-1.17	-1.08	-1.47
Belarus	6.9	6.3	4.2	4.8	4.1	-0.91	-0.51	-1.07
Ukraine	32.5	28.7	18.4	22.3	19.6	-0.88	-0.84	-1.26
Russian Federation	102.4	91.7	66.0	73.8	65.5	-0.79	-0.74	-0.98
Japan	84.9	74.6	52.3	66.7	59.4	-0.77	-0.86	-1.07
Niger	6.5	11.1	31.0	5.8	9.9	3.65	3.58	3.48
Timor-Leste	0.6	0.9	2.2	0.4	0.7	3.71	3.38	3.05
Western Sahara	0.3	0.5	0.6	0.2	0.4	3.78	3.70	1.66
Afghanistan	12.7	21.6	50.0	8.5	15.3	3.87	3.53	3.04
Yemen	10.9	18.2	38.2	6.0	11.0	4.03	3.41	2.78

Larger changes are expected for particular countries. The largest negative changes will be in Eastern European countries and the fifth largest decline will occur in Japan. Losses of economically active individuals will range from 11 per cent to 16 per cent in these cases, implying average annual growth rates of –0.8 per cent to –1.2 per cent (table II.5 and figure II.13). At the other end of the scale, the increases in the economically active population, in an assortment of least developed countries, will be 73 per cent to 83 per cent over 15 years, implying average annual growth rates of 3.7 per cent to 4.0 per cent.

These estimates only go to 2020 because the proportions economically active are only projected to that date by the International Labour Organization. Since percentage changes in the economically active population is fairly close to percentage changes in the population in the main working ages, the latter can be used as a proxy indicator for longer-term change. From 2005 to 2050, the lowest and highest annual growth rates for the population aged 15-64 are -1.5 per cent for Bulgaria and 3.5 per cent for Niger (table II.5). The long-run negative growth rates tend to be slightly more extreme than negative rates to 2020, implying slightly accelerating decline to 2050. The long-run positive growth rates tend to be smaller than near-term rates but still quite high. Extremes in either direction suggest radical changes in the future. Bulgaria will lose almost half its current working age population by 2050 and Niger will have almost five times its current working age population. The effects are so large not because rates of change are so high but because they are maintained for so long.

Figure II.13. Annual growth rates in the population in the main working ages to 2020 and the working-age population to 2020 and 2050, for countries with the lowest and highest rates



By 2050, 11 countries in all will lose at least a third of their 2005 working age populations. The majority of these will be in Eastern Europe, but Japan, Georgia and Guyana will also be in the group. Fifteen other countries will lose at least a quarter of their working age populations—a more varied group including the Republic of Korea and Cuba. At the other end, five countries in sub-Saharan Africa, including Niger, will have working age populations at least

four times larger than in 2005. Fourteen more countries will have working age populations three times larger. Most will be in sub-Saharan Africa, the exceptions being Timor-Leste, Afghanistan, the Occupied Palestinian Territories and Yemen.

D. OLD PERSONS

The number of older persons is outpacing the number of children by far and the oldest old (aged 80 and older) are growing even faster. The world's population aged 65 and over increased at an annual rate of 2.4 per cent in 1950-2005, far above the rate of 1.4 per cent for those aged 0-14. Growth rates for older persons have fluctuated considerably (figure II.14), partly because of relatively small numbers. But small numbers will not continue to characterize this group: by 2005, those aged 65 and over were a quarter of those aged 0-14, by 2030 they will be more than half and though they will not reach parity by 2050, that day will come not long after.

Among the group of older persons, the oldest old are increasing faster. Those aged 80 and over increased at an average annual rate of 33 per cent from 1950 to 2005 and those aged 90 and over increased at an average rate of 3.9 per cent. In the next half century, those aged 65 and over and those aged 80 and over are projected to grow at the same rate as before, but those aged 90 and over will grow even faster, at an average rate of 4.3 per cent annually. The population in the oldest ages is still comparatively small. In 2005, 88 million worldwide were aged 80 and over, slightly more than the population of Viet Nam or the Philippines. Those aged 65-79 were much more numerous at 390 million in that year, more than the entire population of South America. Still, those aged 80 and over are growing so fast their number will double by 2025 (table II.6 and figure II.15).

Figure II.14. Annual growth of major age groups for the world, 1950-2050

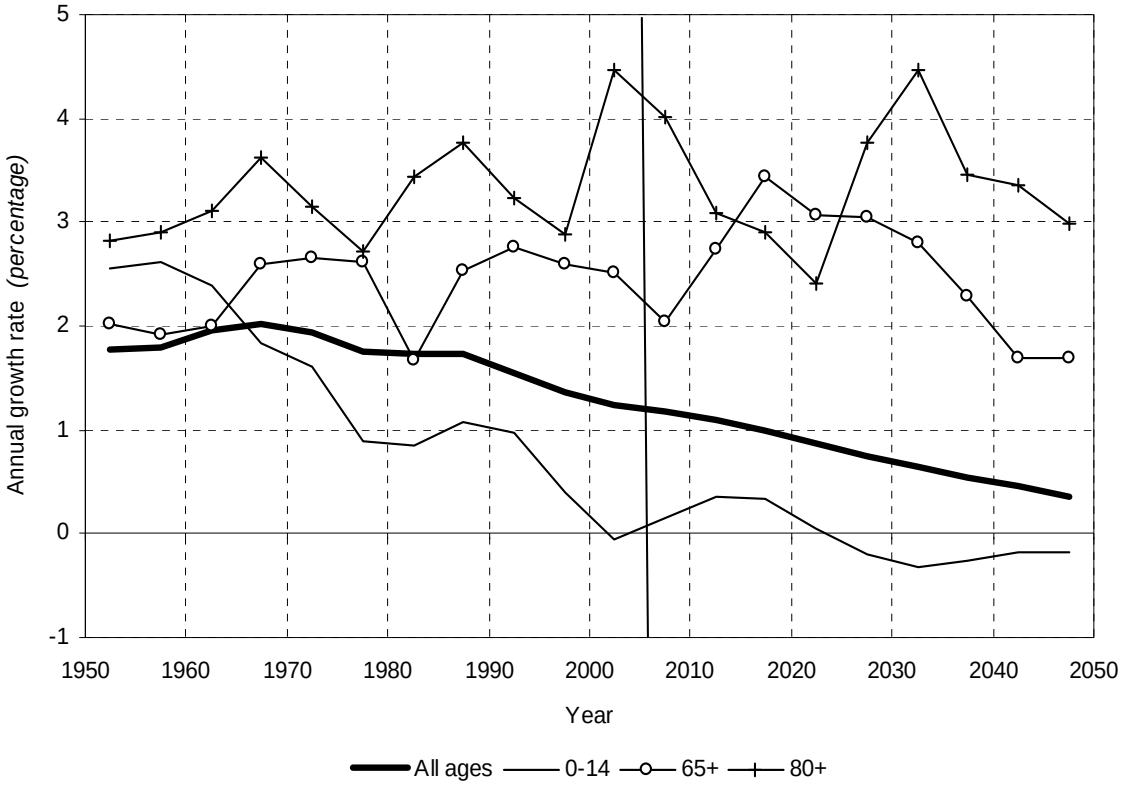
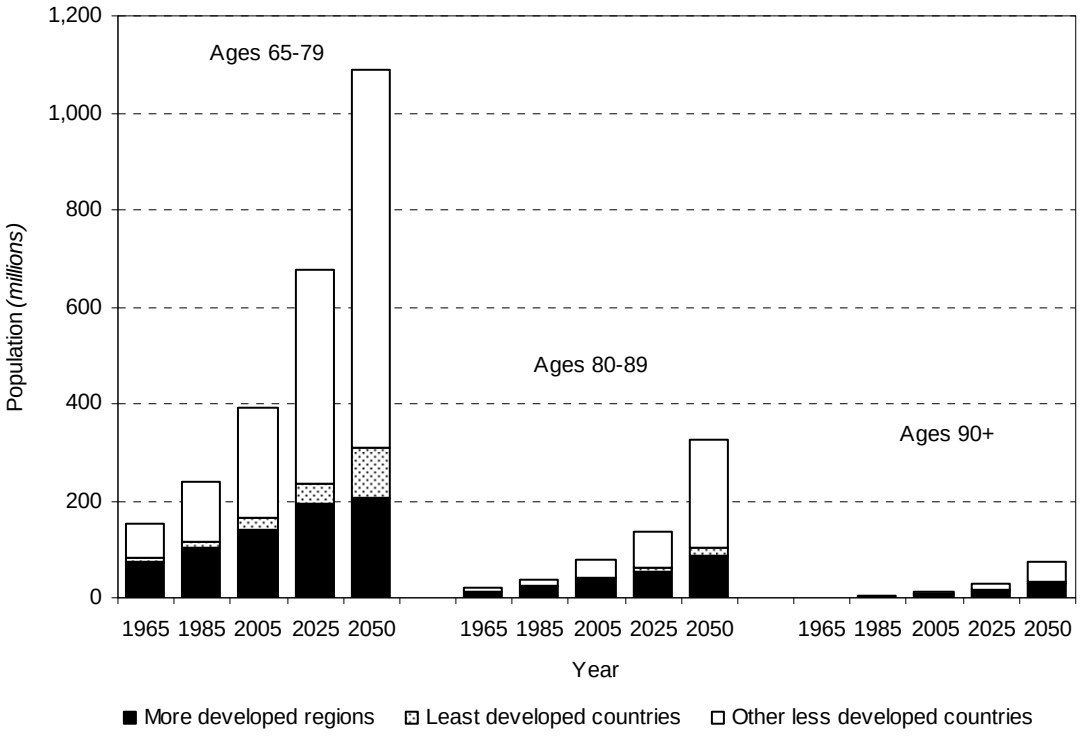


Table II.6. Projected percentage increase in the older population to 2025 and 2050, for the world, by development group and major area

Development group or major area	2005 population (millions)			Percentage increase, 2005-2025			Percentage increase, 2005-2050		
	65 and over	80 and over	90 and over	65 and over	80 and over	90 and over	65 and over	80 and over	90 and over
World	477.4	87.7	10.8	76	86	149	213	358	583
More developed regions	185.6	44.4	6.9	41	54	108	75	164	343
Less developed regions	291.7	43.2	3.9	98	119	221	300	558	1003
Least developed countries	24.9	3.1	0.2	95	103	138	380	496	669
Other less developed countries	266.8	40.1	3.7	98	120	226	292	563	1022
Africa	31.3	3.8	0.3	88	107	156	343	473	768
Asia	250.4	38.6	3.8	93	119	232	268	516	903
Europe	116.2	25.7	3.7	28	46	95	58	148	306
Latin America and the Caribbean	35.0	6.9	0.9	103	116	190	307	480	782
Northern America	41.0	11.8	2.0	74	41	71	133	197	367
Oceania	3.4	0.9	0.1	82	76	141	176	281	589

Figure II.15. Number of older persons by development group, 1965-2050



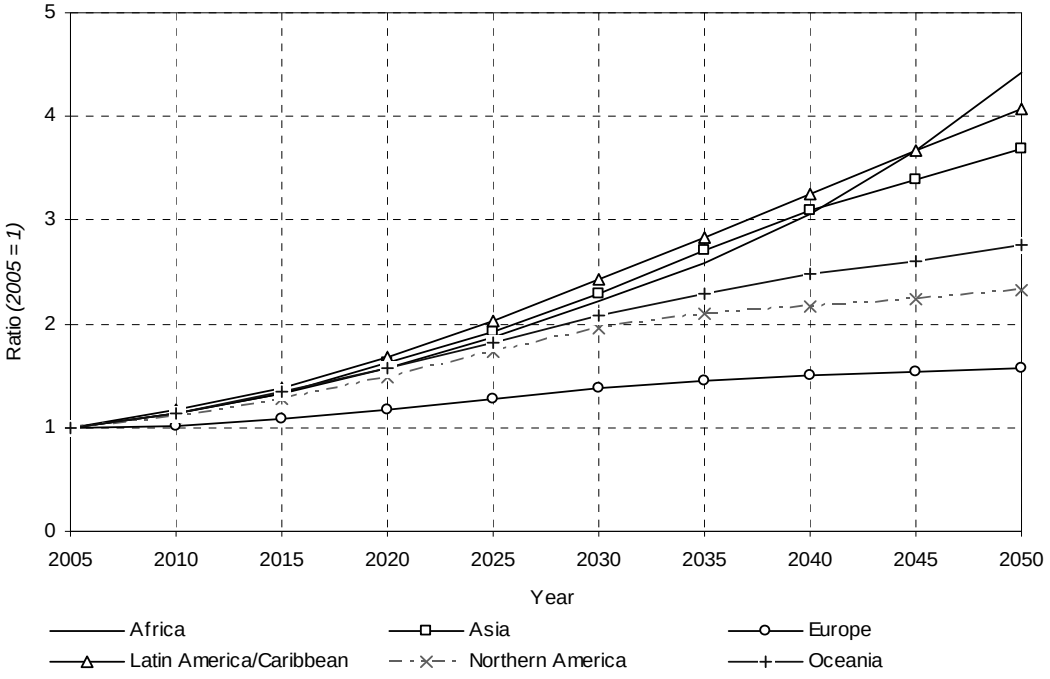
From 1950 to 1980, close to one half of all those aged 65 and over were in more developed regions. The proportion dropped to about 40 per cent by 2005, will be close to 30 per cent by 2025 and will slip to just over 20 per cent by 2050. The population aged 80 and over was about evenly divided between more developed regions and other regions in 2005, but the trend is going in the same direction. By 2045, the more developed regions will have only a third of all people of these ages. The population aged 90 and over will follow the same trajectory

eventually, from almost two-thirds being in more developed regions in 2005 to about half in 2035 and so on. More developed regions have already had a major boom in the number older persons and more and more of them survive to even more advanced ages in less developed regions excluding the least developed countries (i.e., other less developed countries).

In 2005, there were 250 million people aged 65 and over in Asia, in contrast to 116 million in Europe and 41 million in Northern America. By 2025, people of this age will come close to doubling in Asia but increase by only a quarter in Europe and by three-quarters in Northern America. Proportionally comparable increases to those in Asia will be recorded in Africa, Latin America and the Caribbean and Oceania (figure II.16). Although median age in Europe is at least 10 years above that in Africa, Asia and Latin America and the Caribbean (table II.1), people aged 65 and over are more numerous in Asia and are increasing much faster in Asia, Latin America and the Caribbean and Africa than in Europe. In Africa in particular growth will be very rapid toward the middle of the century, accelerating after 2030 while it moderates elsewhere (table II.6).

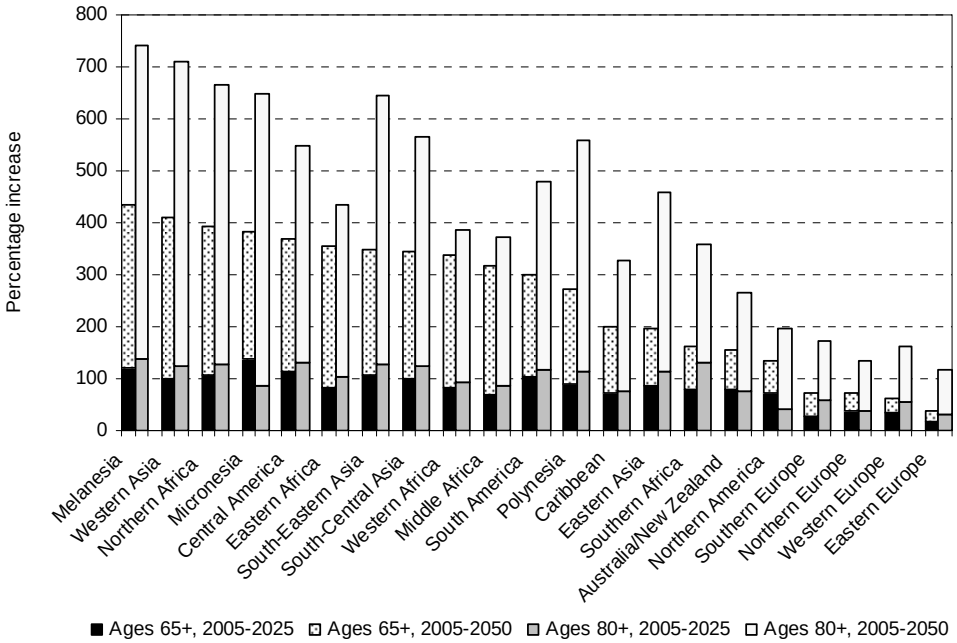
Even more rapid growth will characterize the age group 80 and over. While those aged 65 and over will increase by about one half in Europe to 2050 and roughly 300 per cent in Africa, Asia and Latin America and the Caribbean, those aged 80 and over will increase 150 per cent in Europe and around 500 per cent in the other three major areas (table II.6).

Figure II.16. Relative growth in the population aged 65 and over, with 2005 population set equal to 1, by major area, 2005-2050



Across regions within these major areas, the population aged 65 and over will increase by 70 per cent to 140 per cent to 2025 except in the European regions, where it will increase 17 per cent to 37 per cent (figure II.17). Up to 2050, the increases will vary much more, with contrasting percentages in regions within the same major area: up to 430 per cent in Melanesia but 270 percent in Polynesia, 410 per cent in Western Asia but 195 per cent in Eastern Asia, 390 per

Figure II.17. Percentage increase in the population aged 65 and over and aged 80 and over between 2005-2025 and 2005-2050 by region



cent in Northern Africa but 320 per cent in Middle Africa, 370 per cent in Central America but 200 per cent in the Caribbean. Only for Europe will there be relative homogeneity, with increases to 2050 of 40 per cent to 75 per cent.

If these increases appear large, they still fall short of increases in the population aged 80 and over, which go up to 750 per cent by 2050. As will be the case for those aged 65 and over, those aged 80 and over will increase by less in European regions and to some degree in Northern America and Australia/New Zealand.

A few countries will experience stunning increases in number of older persons. In the United Arab Emirates, those aged 65 and over were 20,000 in 1985 and had more than doubled to 45,000 by 2005. By 2025, they will quadruple to 186,000 and from that point to 2050 they will increase eight times (or thirty-five times if compared to those in 2005) to 1.56 million. Qatar and Kuwait will not match that, but older Qataris and Kuwaitis will still increase about 2,000 per cent from 2005 to 2050 (not shown). The age group of older persons will also grow very fast, particularly toward mid-century, in several other Western Asian countries and in such varied, generally small countries as Brunei, French Guiana and Singapore. At the other extreme, countries where the age group of older persons will hardly increase are mainly in Eastern Europe. A 13 per cent increase to 2050 is the lowest projected, for Ukraine.

Europe, to be sure, already has a high proportion of the population at older ages: 16 per cent aged 65 and over in 2005, in contrast to 1.1 per cent to 1.8 per cent in the United Arab Emirates, Qatar and Kuwait. At the end of the spectacular increases in the age group of older persons in the latter three countries, they will still each have only 17 per cent to 20 per cent of their populations at older ages. This would be high but not unusual by current European standards. What is exceptional is the rapidity of the projected increases. From 1960 to 2005, a similar period of 45 years, the population aged 65 and over in Europe increased 117 per cent and except in three Balkan states all country increases were under 200 per cent. The largest increases in Europe were relatively slow. None of the percentage increases, if compared to projected increases from 2005 to 2050, would make the top 50.

If Europe took its time getting where it is, it does face ageing populations, not solely because the numbers of its older persons are increasing but

also because younger people are not keeping up. The share of older persons in the European population was 14 per cent to 18 per cent across European regions in 2005 and will be 24 per cent to 31 per cent by 2050, as high or higher than in other regions. In Western Asia, where the largest percentage increases in the older age group will occur, the share of older persons on the population was only 5 per cent in 2005 and will rise only to 13 per cent (figure II.18).

As the group of older persons becomes a larger proportion of the total population, they become older themselves. Those aged 80 and over were only 12 per cent of the age group of older persons in Africa in 2005 and they were 22 per cent in Europe. By 2050, those aged 80 and over will be around 30 per cent of the age group of older persons not only in Europe but also in Northern America and Oceania (table II.6).

The countries with the highest proportion of the population aged 65 and over will change between 2005 and 2050, with one exception. Japan is the oldest society now, based on the proportion of the population aged 65 and over and will still be the oldest in 2050 (table II.7 and figure II.19). The 20 per cent of Japanese aged 65 and over in 2005 will become 38 per cent by 2050. The next 26 countries following Japan in 2005 are all European, led by Italy and Germany and all have at least 14 per cent of their populations aged 65 and over. By 2050, Japan will be followed instead by the Republic of Korea and Macao SAR China. Some European countries will also be near the top, but joining them, with at least 30 per cent of their populations aged 65 and over, will be Martinique, Singapore, Hong Kong SAR China, and the Netherlands Antilles.

By 2025, about 30 countries will have populations older than Japan's population was in 2005, with more than 20 per cent of the population aged 65 and over. By 2050, over 70 countries will have passed this level. Whether or not these compositional changes are a greater or lesser concern than the absolute increases in the number of older persons in other countries, both types of changes will lead to societal readjustments.

Figure II.18. Proportion of the population aged 65 and over by region, 2005, 2025 and 2050

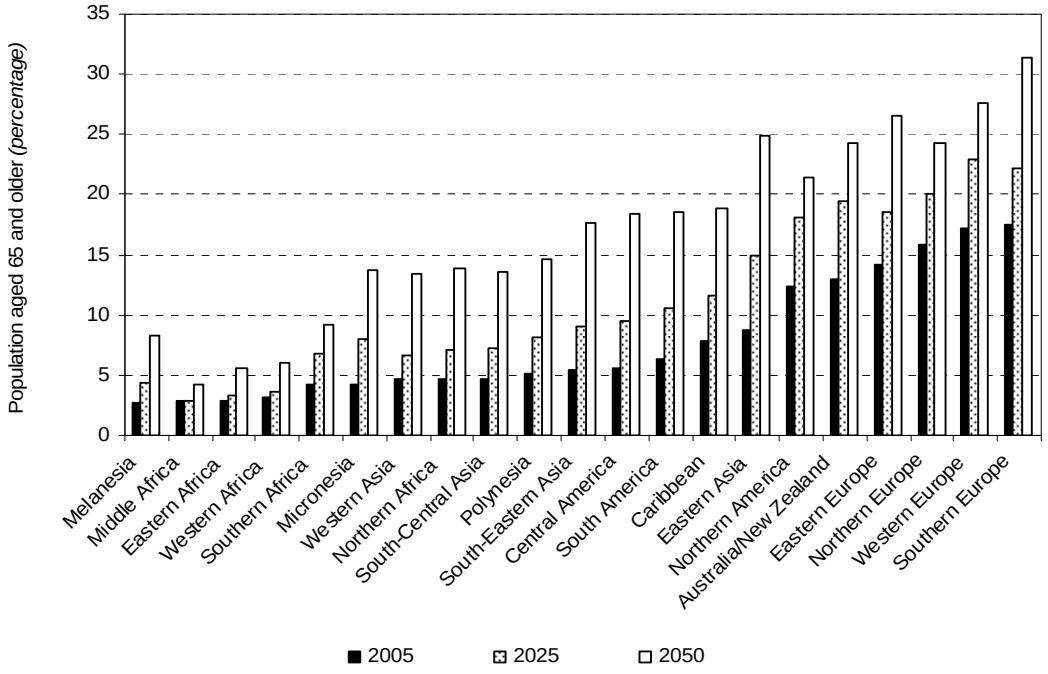
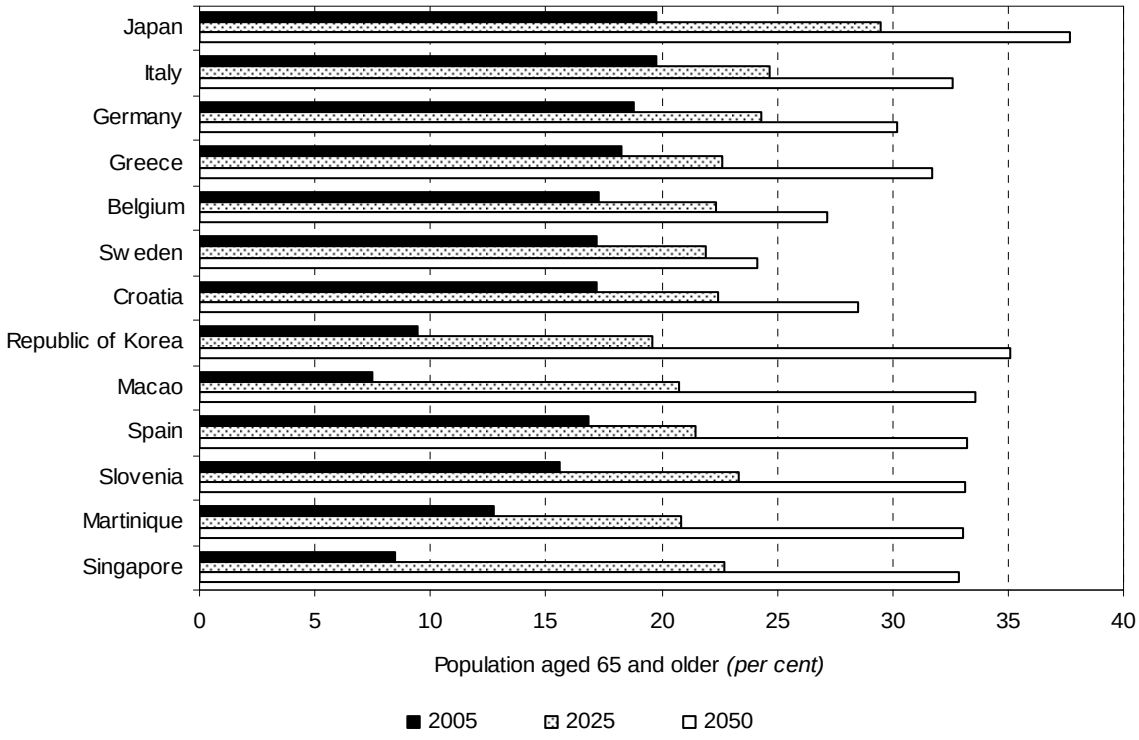


TABLE II.7. TOP TWENTY COUNTRIES WITH THE HIGHEST PERCENTAGE OF POPULATION AGED 65 AND OVER IN 2005, 2025, 2050

	2005		2025		2050	
Country	*Percentage*	*(Rank)*	*Percentage*	*(Rank)*	*Percentage*	*(Rank)*
Japan	19.7	(1)	29.5	(1)	37.7	(1)
Italy	19.7	(2)	24.6	(2)	32.6	(9)
Germany	18.8	(3)	24.4	(3)	30.2	(18)
Greece	18.3	(4)	22.6	(7)	31.7	(13)
Belgium	17.3	(5)	22.4	(11)	27.1	(30)
Sweden	17.2	(6)	21.9	(15)	24.1	(44)
Croatia	17.2	(7)	22.5	(9)	28.5	(24)
Bulgaria	17.2	(8)	22.0	(12)	31.8	(12)
Portugal	16.9	(9)	21.4	(23)	30.7	(16)
Spain	16.8	(10)	21.4	(21)	33.2	(4)
Finland	15.9	(17)	23.8	(4)	25.6	(37)
Slovenia	15.6	(18)	23.3	(5)	33.1	(5)
Channel Islands	14.7	(25)	22.5	(10)	29.6	(20)
Martinique	12.7	(40)	20.8	(26)	33.1	(6)
China, Hong Kong SAR	12.0	(46)	21.7	(20)	32.6	(8)
United States Virgin Islands	10.7	(53)	22.6	(8)	25.5	(38)
Netherlands Antilles	9.8	(57)	17.3	(51)	32.5	(10)
Republic of Korea	9.4	(58)	19.6	(34)	35.1	(2)
Singapore	8.5	(61)	22.8	(6)	32.8	(7)
China, Macao SAR	7.5	(68)	20.7	(27)	33.5	(3)

Figure II.19. Proportion of the population aged 65 and over: thirteen countries with the highest levels in 2005 and 2050



III. FERTILITY

Falling fertility is transforming world populations. The process is ongoing and this chapter provides a snapshot of where fertility is, how it has gotten there and where these projections say it is likely to go in the future. Changing fertility has contributed, more than the other two components of population change (mortality and migration) to great changes in population densities, to shifts in the demographic weight—or burden—of nations, to more youthful societies previously but increasingly to more aged ones. In at least one important respect, the future of fertility is unclear, so that periodic reviews such as this are meant to calibrate the outlook for the future.

A. CURRENT FERTILITY

Total fertility, the number of children the typical woman would have at current rates, is widely different among development groups, from 5.0 children per woman in least developed countries to 2.6 children per woman in other less developed countries (i.e., less developed regions excluding the least developed countries) to 1.6 children per woman in more developed regions (table III.1). High total fertility in least developed countries, though well below previously recorded peaks, practically guarantees robust population growth, which, as has been described, is in fact in prospect. The fertility level in other less developed countries is also above replacement, the level at which reproductive age women are only having enough daughters to replace themselves. (The replacement level is approximately 2.l children of either sex per woman, varying depending on the likelihood of survival). In more developed regions, fertility is not only below replacement level but also at or near a historic low for such a large group of countries.

By region, the contrasts are quite extreme (table III.1), with three tropical regions of sub-Saharan Africa (Eastern Africa, Middle Africa and Western Africa) above 5.5 children per woman and Eastern Europe down to 1.3 children per woman. The other two African regions are much lower than the tropical part of Africa, with Northern Africa at 3.2 children per woman and Southern Africa at 2.9 children per woman. Europe is relatively more homogeneous, with Northern Europe the highest but at only 1.7 children per woman. Australia/New Zealand is slightly higher at 1.8 children per woman and Northern America still higher at 2.0 children per woman. These low fertility regions are clearly distinguished from most other regions, none of which is below replacement level. The exception is Eastern Asia, which is down to 1.7 children per woman, the same level as Northern Europe. Total fertility ranges upward in Asia to 2.5 children per woman in South-Eastern Asia and 3.2 children per woman in South-Central Asia and Western Asia. The three regions of Latin America and the Caribbean are bunched at 2.5 children per woman to 2.7 children per woman.

Within regions, a few countries stand out. In Middle Africa, Gabon, at 3.4 children per woman, is well below the regional average of 6.2 children per woman. In Western Africa, where regional fertility is 5.8 children per woman, Cape Verde is two points lower at 3.8 children per woman. In Eastern Africa, at least two points lower than the regional average of 5.6 children per woman are Mauritius (1.9), Réunion (2.5) and Zimbabwe (3.6). Well above regional averages, by at least two points, are Timor-Leste (7.0 children per woman versus 2.5 children per woman in South-Eastern Asia), Afghanistan (7.5 children per woman versus 3.2 children per woman in South-Central Asia) and Yemen and the Occupied Palestinian Territories (6.0 children per woman and 5.6 children per woman versus 3.2 children per woman in Western Asia).

Births in 2000-2005, 133.5 million a year, were distributed in proportion to population modified by fertility levels. With a quarter of world population, high-fertility South-Central Asia had 30 per cent of births. With almost as large a population, Eastern Asia had only 15 per cent of births. As figure III.1 shows, African regions had more than their share of births relative to population, European regions as well as Australia/New Zealand and Northern America had less than their share.

TABLE III.1. TOTAL FERTILITY FOR THE WORLD AND BY DEVELOPMENT GROUP, MAJOR AREA, AND REGION, SELECTED PERIODS

(children per woman)

Development group or major area and region	*1950-1955*	*1960-1965*	*1970-1975*	*1980-1985*	*1990-1995*	*2000-2005*	*2020-2025*	*2045-2050*
World	**5.02**	**4.98**	**4.47**	**3.58**	**3.05**	**2.65**	**2.29**	**2.02**
More developed regions	2.84	2.69	2.13	1.85	1.68	1.56	1.64	1.79
Less developed regions	6.15	6.04	5.41	4.15	3.42	2.90	2.40	2.05
Least developed countries	6.67	6.76	6.61	6.28	5.68	4.95	3.68	2.50
Other less developed countries	6.09	5.95	5.25	3.87	3.11	2.59	2.14	1.91
Africa	**6.75**	**6.87**	**6.72**	**6.46**	**5.69**	**4.98**	**3.61**	**2.46**
Eastern Africa	6.97	7.03	7.01	6.85	6.24	5.60	3.85	2.47
Middle Africa	6.04	6.27	6.48	6.63	6.46	6.21	4.84	2.84
Northern Africa	6.82	7.06	6.46	5.74	4.20	3.16	2.37	1.96
Southern Africa	6.46	6.29	5.57	4.72	3.52	2.90	2.27	1.88
Western Africa	6.86	6.93	7.03	7.01	6.57	5.77	3.84	2.55
Asia	**5.87**	**5.65**	**5.04**	**3.67**	**2.97**	**2.47**	**2.08**	**1.90**
Eastern Asia	5.67	5.15	4.46	2.47	1.88	1.66	1.80	1.83
South-Central Asia	6.06	6.02	5.50	4.84	4.10	3.19	2.27	1.93
South-Eastern Asia	5.96	6.19	5.58	4.18	3.12	2.51	1.98	1.86
Western Asia	6.49	6.27	5.75	5.03	4.09	3.22	2.45	2.03
Europe	**2.66**	**2.58**	**2.16**	**1.89**	**1.58**	**1.41**	**1.56**	**1.76**
Eastern Europe	2.91	2.43	2.15	2.09	1.63	1.26	1.42	1.68
Northern Europe	2.32	2.73	2.08	1.81	1.81	1.69	1.82	1.84
Southern Europe	2.65	2.71	2.54	1.83	1.41	1.36	1.56	1.79
Western Europe	2.39	2.67	1.93	1.61	1.50	1.58	1.66	1.80
Latin America and the Caribbean	**5.88**	**5.97**	**5.04**	**3.92**	**3.03**	**2.53**	**2.04**	**1.86**
Caribbean	5.27	5.49	4.40	3.37	2.83	2.56	2.20	1.91
Central America	6.74	6.77	6.40	4.49	3.47	2.67	2.04	1.85
South America	5.69	5.77	4.65	3.79	2.88	2.47	2.02	1.85
Northern America	**3.46**	**3.35**	**2.01**	**1.81**	**1.99**	**1.99**	**1.85**	**1.85**
Oceania	**3.87**	**3.98**	**3.23**	**2.59**	**2.48**	**2.37**	**2.12**	**1.93**
Australia/New Zealand	3.27	3.41	2.59	1.92	1.89	1.79	1.85	1.85
Melanesia	6.29	6.22	5.81	5.17	4.51	4.10	2.73	2.09
Micronesia	6.30	6.51	5.37	4.46	3.82	3.01	2.17	1.78
Polynesia	6.69	6.97	5.42	4.53	3.91	3.28	2.42	1.97

BOX III.1. FERTILITY DEFINITIONS

Total fertility (total fertility rate, TFR) In common usage and in this report, total fertility is interpreted as the number of children per woman. Technically it is defined as the average number of children a group (birth cohort) of women would have during their lifetimes if none died before the end of the childbearing years and if they experienced the age-specific birth rates of the period in question. Total fertility is calculated by summing the birth rates at each age (the age-specific birth rates, or ASFRs) for a particular period, e.g., a single year or, for this report, a 5-year period such as 2000-2005.

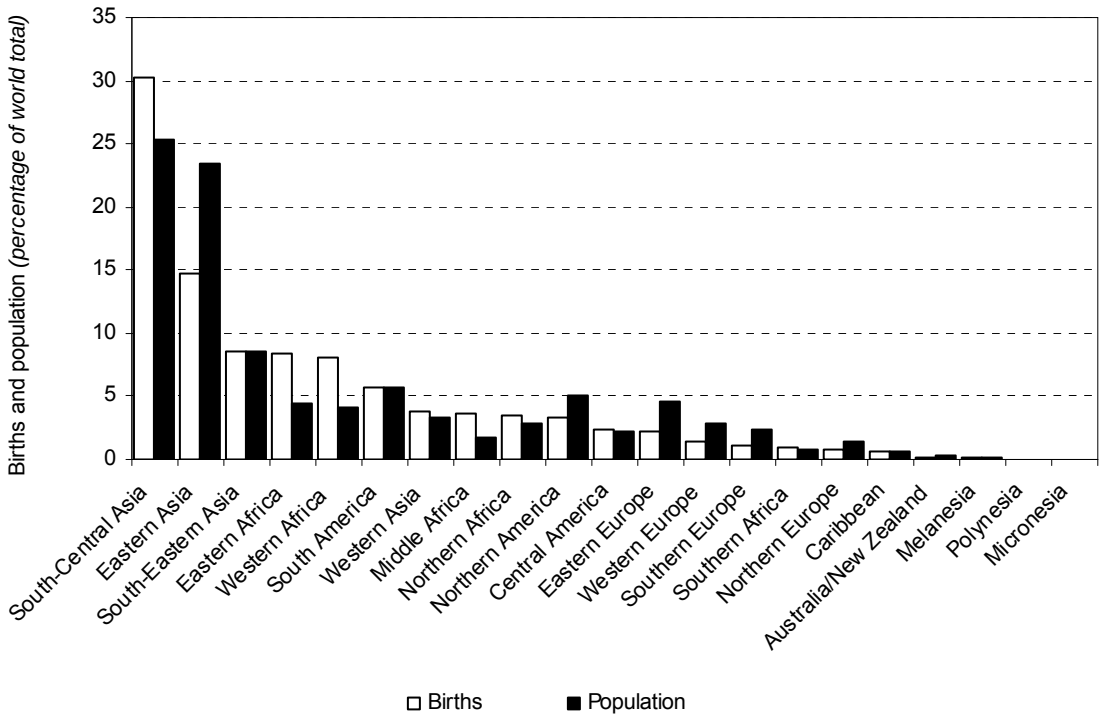
High fertility Total fertility levels above 5 children per woman.

Low fertility Total fertility levels in the range of 2 to 3 children per woman.

Replacement-level fertility Total fertility levels of about 2.1 children per woman. This corresponds to the average number of children a woman needs to have to produce one daughter who survives to childbearing age. If sustained over the long run, each generation will replace itself (disregarding migration). For most countries, replacement level is close to 2.1 children per woman, but the actual levels vary slightly from country to country, depending on mortality conditions up to the end of the childbearing ages.

Below-replacement fertility Total fertility levels below 2.1 children per woman.

Figure III.1. Percentage distribution of births and population worldwide by region, 2000-2005

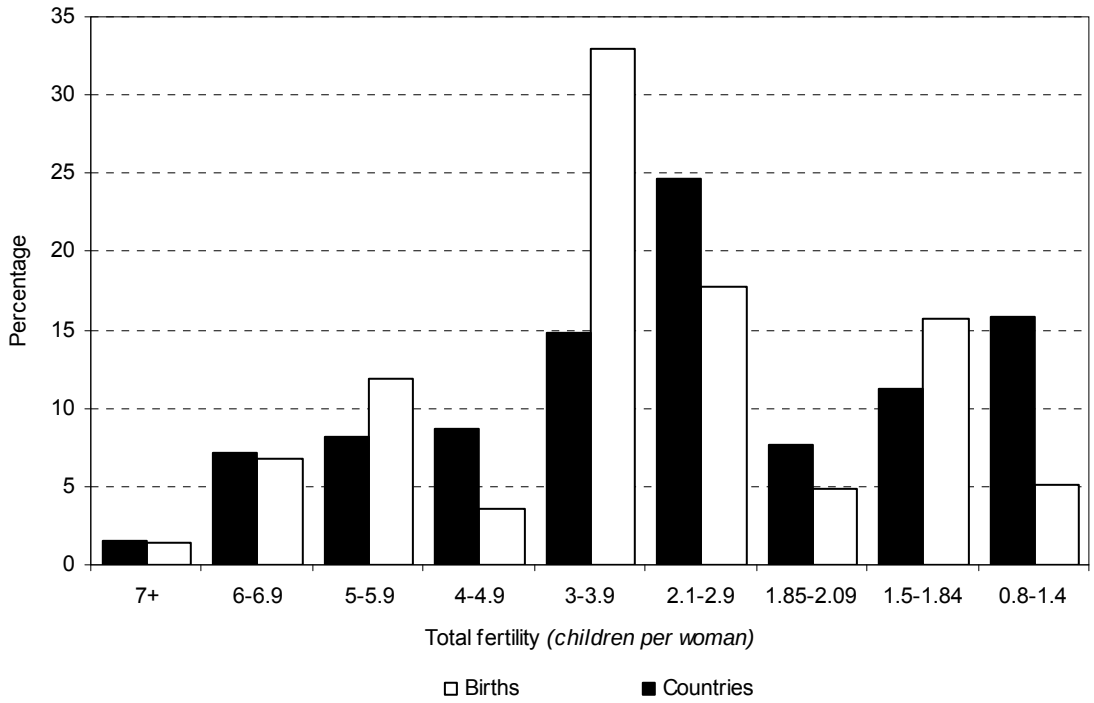


One can look at the distribution of births differently, in relation to fertility levels. A third of all births worldwide in 2000-2005 were in countries where fertility was at least 3 children per woman but less than 4 children per woman (figure III.2). There were 29 countries at this fertility level, or 15 per cent of the world's 195 countries. Countries with total fertility under 3 children per woman were 59 per cent of the world's countries, but accounted for only 43 per cent of births. Countries with total fertility of 4 children per woman or higher were 26 per cent of the world's countries and accounted for almost the same share of births. Different implications could be drawn from these distributions. For instance, if one were interested in reducing births, the gains from targeting high fertility countries, though they could be large for the particular countries, would be relatively small in a global perspective. Or if one were interested in reaching mothers with infants, whether with a health message or a commercial message, a greater number of them would be found in countries where fertility is moderate, though they would at the same time be a smaller proportion of local populations.

Looking at specific countries, one may note that half the world's births are in just seven countries in 2000-2005. India is first, with 27.4 million annual births, or 20.5 per cent of the total. China is second, with 17.6 million or 13.2 per cent of the total, followed at some distance by Nigeria (4.3 per cent), Indonesia (3.4 per cent) Pakistan (3.1 per cent), the United States (3.1 per cent) and Bangladesh (3.0 per cent). One of every three babies born in 2000-2005 was therefore either Indian or Chinese, whereas almost one in thirty was American.

Most women giving birth tend to be between the ages of 20 and 39. Some are older and some younger, the proportions varying by setting (table III.2). In the least developed countries, women aged 40 and over contribute 8 per cent of total fertility, or about 0.4 children per woman. In other less developed countries (i.e., less developed regions excluding the least developed countries), the proportion is down to 3 per cent, which translates into 0.1 children per woman. And in more developed regions, the proportion is still lower at 2 per cent, or 0.03 children per woman (figure III.3). In the more developed

Figure III.2. Percentage distribution of countries and births by level of total fertility, 2000-2005



regions and less developed regions excluding the least developed countries (i.e., other less developed countries), women aged 15-19 contribute 8 per cent to 9 per cent of total fertility, in contrast to 13 per cent in the least developed countries, though the latter may be less a function of development status than an African and South Asian pattern. In more developed regions and less developed regions (excluding the least developed countries), fertility is less widely spread across age groups, but the specific patterns vary (figure III.4).

In Latin America and the Caribbean, fertility skews more toward those under age 25. In Asia, it is especially high, proportionally, at ages 20-29. And in Europe, Northern America and Oceania, ages 25-29 is the peak.

If countries are grouped by fertility level (as in figure III.2), a pattern appears (figure III.5). With lower total fertility, fertility at the oldest ages, ages 40-49, tends to be proportionally lower and fertility at ages 25-29 tends to be proportionally higher. At ages 20-24 and 30-34, there may be an upward tendency with lower rather than higher overall fertility, but it is not entirely consistent. Similarly, at ages 15-19 and 35-39, there is some downward tendency, but it is neither strong nor entirely consistent. Besides the differences in age patterns related to fertility levels, therefore, countries differ in relatively subtle ways in the age of their expectant mothers.

TABLE III.2. AGE-SPECIFIC FERTILITY FOR THE WORLD AND BY DEVELOPMENT GROUP, MAJOR AREA AND REGION, 2000-2005 (*children per 1,000 women)*

Development group or major area and region	*15-19*	*20-24*	*25-29*	*30-34*	*35-39*	*40-44*	*45-49*
World	**55.3**	**159.1**	**156.7**	**95.2**	**47.1**	**16.2**	**4.3**
More developed regions	24.5	74.0	95.4	81.0	34.5	6.3	0.3
Less developed regions	60.3	174.8	169.1	98.4	50.3	19.2	5.7
Least developed countries	130.2	236.9	227.6	184.3	123.8	60.7	21.7
Other less developed countries	47.2	163.9	160.0	86.8	41.1	14.1	3.9
Africa	**116.0**	**223.2**	**234.1**	**199.2**	**136.9**	**63.7**	**21.5**
Eastern Africa	120.5	255.3	252.6	218.6	157.6	82.2	33.7
Middle Africa	189.5	293.0	269.0	227.2	159.2	80.7	23.7
Northern Africa	36.9	135.8	174.1	148.2	91.7	34.6	9.2
Southern Africa	70.4	142.5	145.1	109.2	71.3	29.8	9.7
Western Africa	146.9	244.2	269.1	232.9	163.7	74.4	22.7
Asia	**41.0**	**164.4**	**158.8**	**81.0**	**35.2**	**11.5**	**3.3**
Eastern Asia	2.5	121.3	140.1	52.4	11.7	1.9	0.5
South-Central Asia	69.1	212.7	178.6	100.9	49.0	17.5	6.1
South-Eastern Asia	39.8	125.7	148.2	103.1	61.7	19.8	3.2
Western Asia	44.7	152.4	177.9	134.5	83.3	32.1	11.3
Europe	**20.0**	**69.8**	**87.5**	**73.0**	**31.0**	**5.6**	**0.3**
Eastern Europe	27.6	87.8	76.9	42.2	15.1	2.8	0.2
Northern Europe	21.5	65.3	98.5	96.8	45.7	9.3	0.1
Southern Europe	11.9	47.2	81.0	85.7	40.3	7.3	0.5
Western Europe	9.2	53.0	108.3	97.8	39.5	7.1	0.3
Latin America and the Caribbean	**80.1**	**139.4**	**126.8**	**88.0**	**50.2**	**17.0**	**3.3**
Caribbean	69.0	142.6	129.2	94.0	49.8	17.2	5.2
Central America	79.4	145.1	139.4	96.1	55.5	15.6	3.3
South America	81.5	136.8	121.3	84.0	48.4	17.4	3.1
Northern America	**41.0**	**98.9**	**112.9**	**93.7**	**42.6**	**8.3**	**0.5**
Oceania	**33.5**	**103.9**	**138.9**	**123.8**	**62.3**	**17.2**	**3.1**
Australia/New Zealand	18.8	58.7	105.1	111.8	53.4	10.0	0.5
Melanesia	64.3	207.2	229.4	160.2	92.2	48.9	17.6
Micronesia	45.7	132.0	144.2	127.5	83.6	31.5	7.2
Polynesia	35.9	144.4	183.0	157.7	91.5	31.1	6.7

Figure III.3. Percentage contribution of each age group to total fertility, by development group, 2000-2005

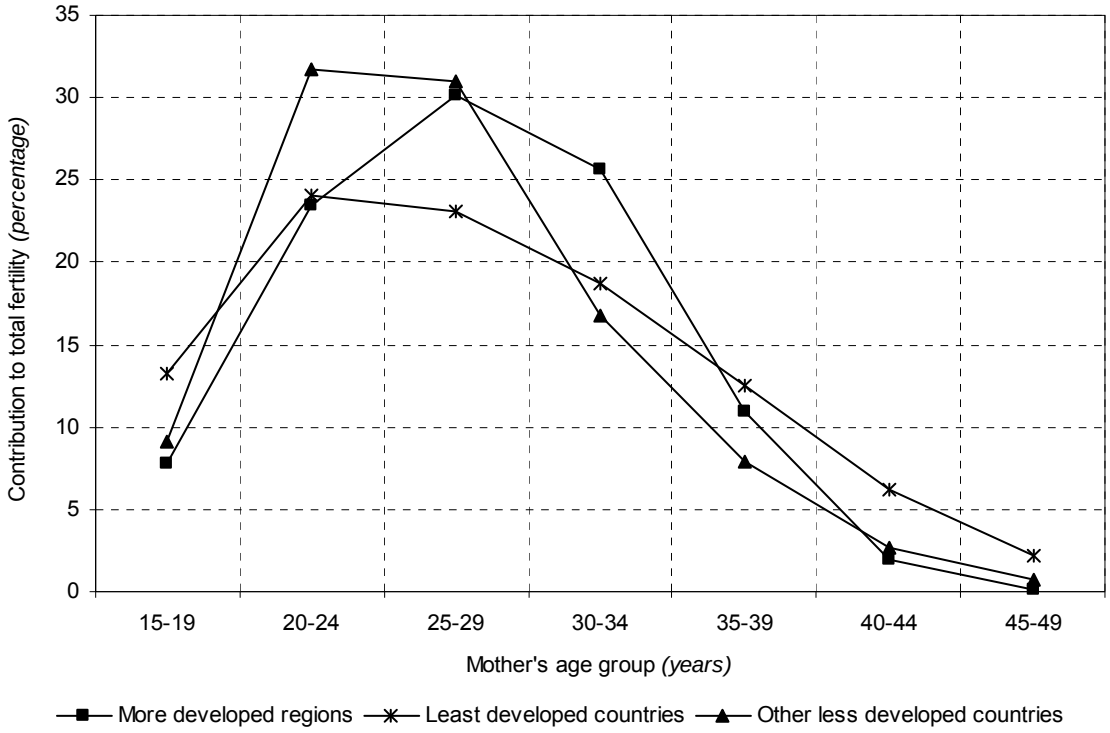


Figure III.4. Percentage contribution of each age group to total fertility, by major area, 2000-2005

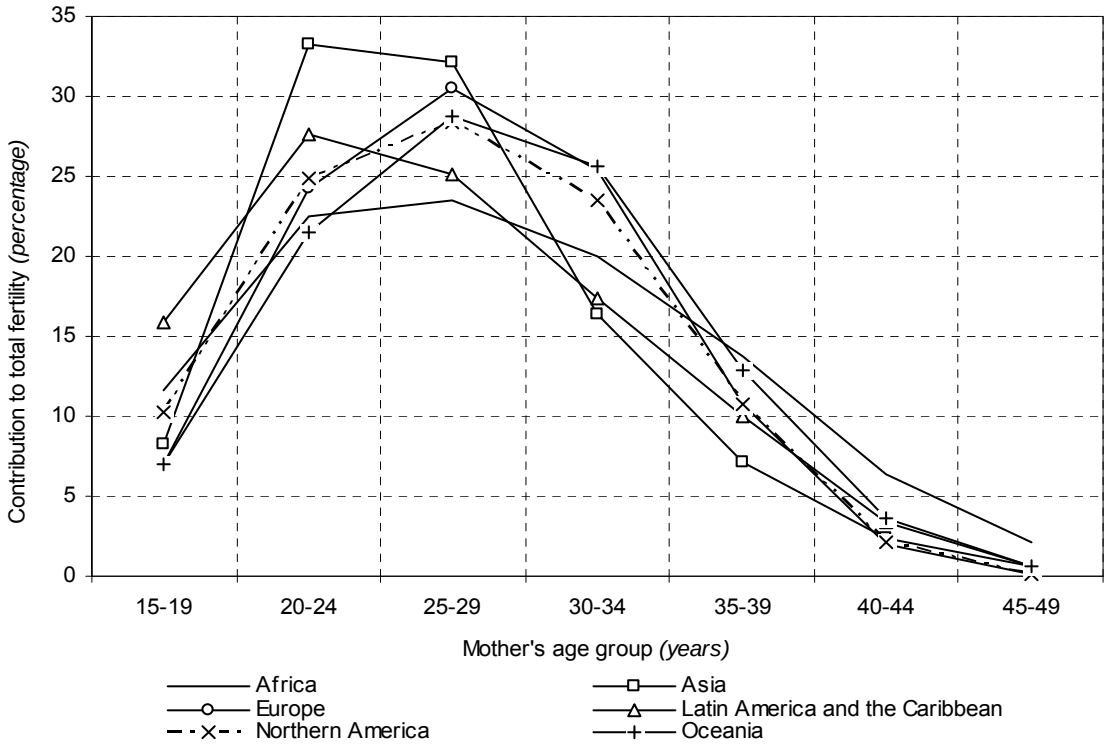
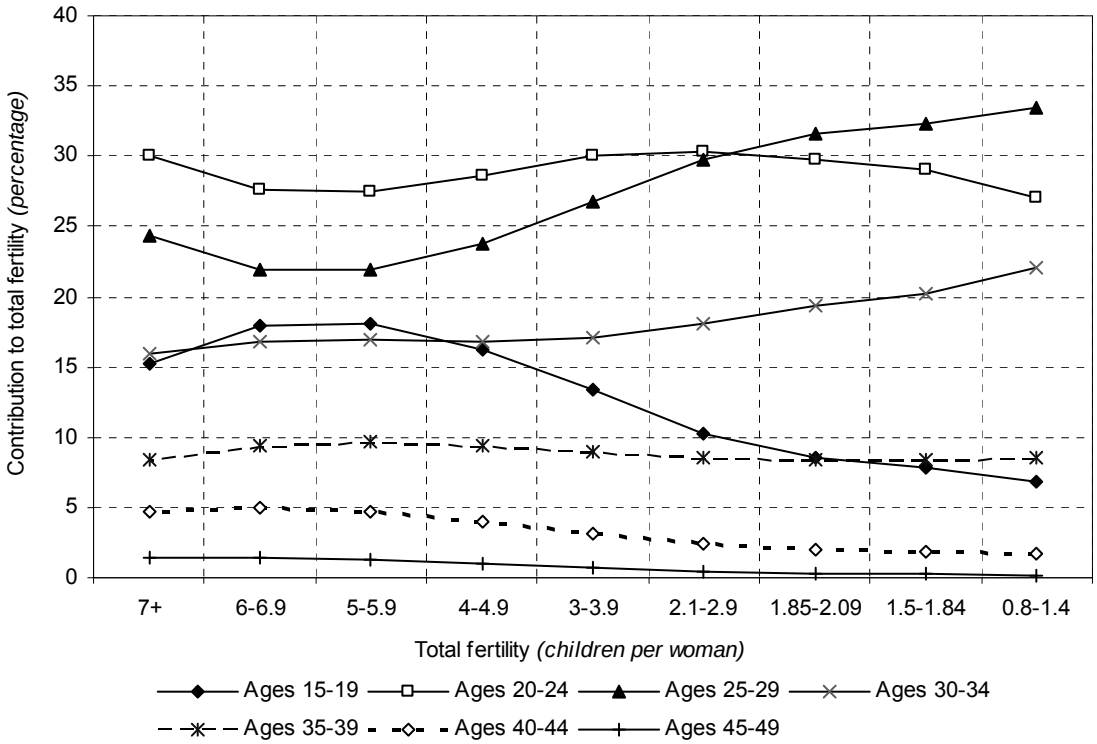


Figure III.5. Percentage contribution of each age group to fertility, by level of total fertility, 2000-2005



B. PAST FERTILITY

Fertility has reached current levels after a long decline in every development group and every region, though not in every country. Decline in individual countries has been sometimes fast, sometimes slow, in a few cases has not started and in a very few is being reversed. Describing different patterns of decline is the concern of this section, which serves also to set the stage for considering future trends.

Even the least developed countries have experienced fertility decline. Total fertility of 5.0 children per woman in least developed countries represents a substantial fall from 6.8 children per woman in the early 1960s (table III.1 and figure III.6). The decline has been sharper in other less developed countries, which had total fertility of 5.9 children per woman in the early 1960s, not much lower than in least developed countries. Fertility decline has also occurred in more developed regions, which in 1970 were collectively above replacement level. Across major world areas, trends in four cases resemble those in the respective development groups (table III.1 and figure III.7). Africa resembles least developed countries, Asia and Latin America resemble other less developed countries and Europe resembles more developed regions, though at a slightly lower level. Northern America had slightly higher fertility, except in the 1970s and early 1980s, than Europe. In Oceania, fertility was generally intermediate between other less developed countries and more developed regions, but is now closely approximating other less developed countries.

Figure III.6. Total fertility for the world and development groups, 1950-2050

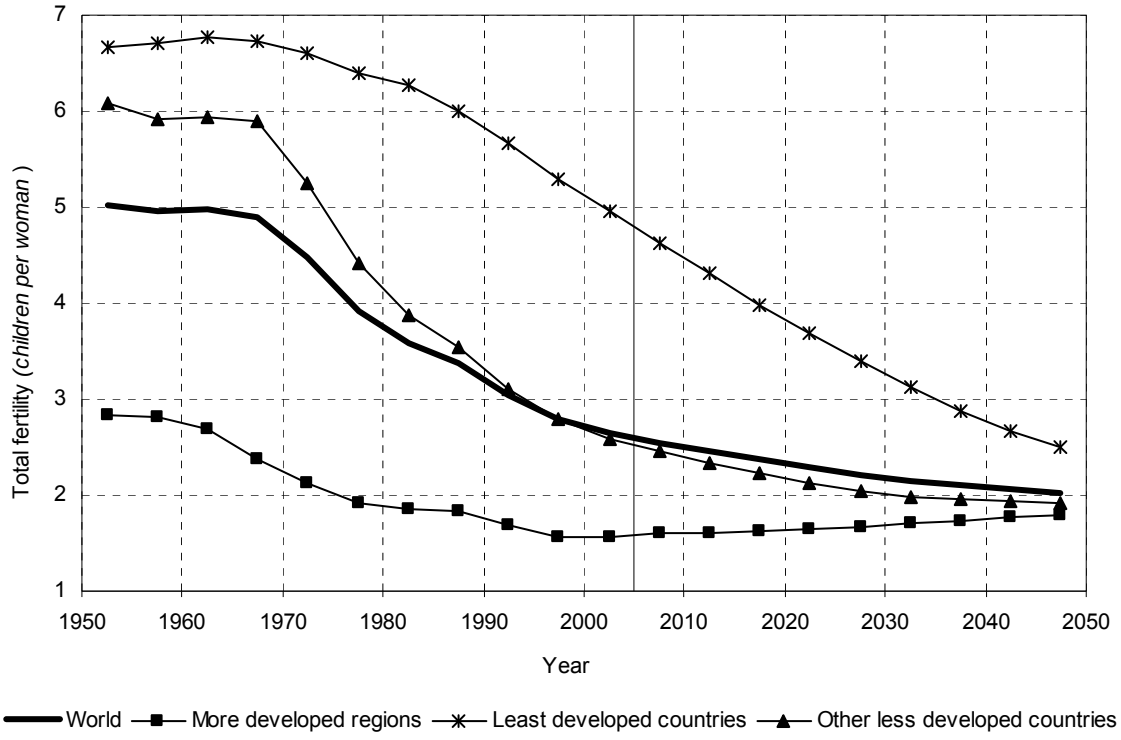
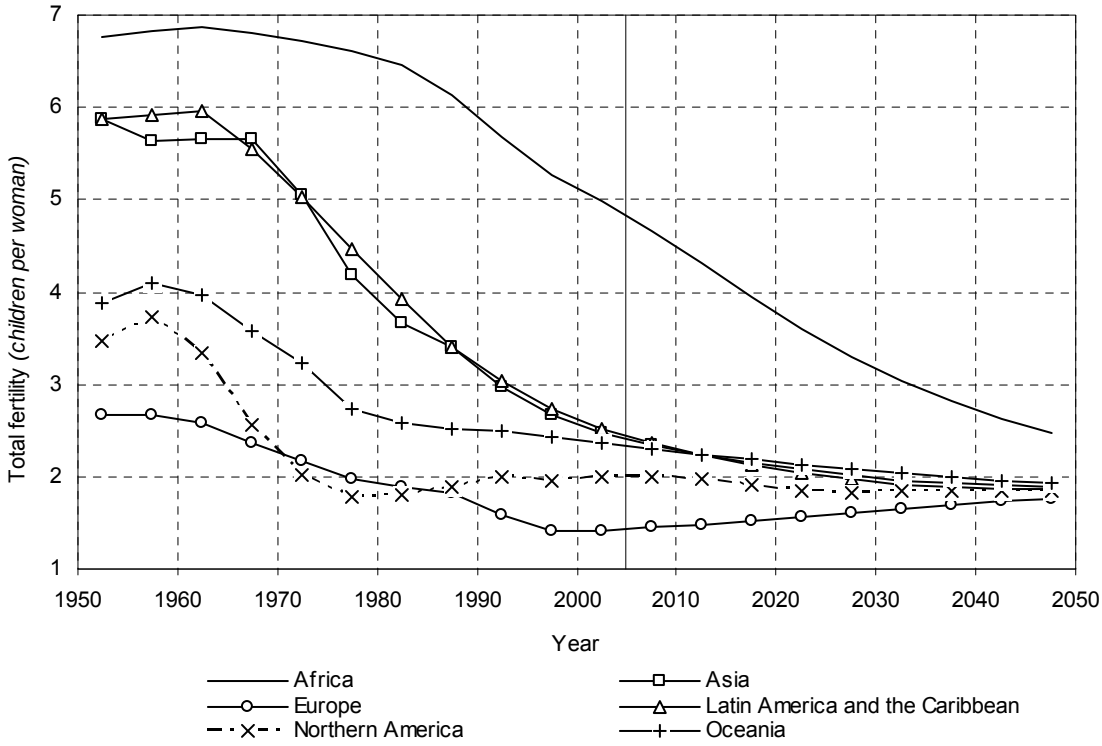


Figure III.7. Total fertility for major world areas, 1950-2050



Over the decades, fertility change was minimal in the 1950s and early 1960s. From 1950-1955 to 1955-1960, average total fertility across countries crept up by 0.04 points; from 1955-1960 to 1960-1965, it changed by –0.02 points. When properly weighted across populations (using the number of women aged 15-49 in each country during these periods), these quinquennial global changes appear even more pronounced during the 1970s when fertility started to decline substantially in countries like China and India (figure III.8). Fertility decline has accelerated somewhat slowly and more in larger than in smaller countries. In recent years, quinquennial decline was greatest around 1990 (that is, from 1985-1990 to 1990-1995), when the unweighted global average change was –0.35 points and the weighted average reached -0.39 points. Since then, with overall fertility levels still declining (table III.1), quinquennial changes are also getting smaller with weighted global average equal -0.16 points around 2005.

Fertility changes across major areas approximate three basic patterns: (*a*) substantial decline in the 1960s or 1970s, followed by an easing of the pace of decline, in Asia, Latin America and the Caribbean, Oceania and Northern America; (*b*) much shallower decline in the 1960s and 1970s, followed by an erratic return to stability in Europe; and (*c*) slow but progressively greater decline till the 1990s in Africa (figure III.9). In one variation from these patterns, fertility in Northern America actually rose in the 1980s and 1990s. The European pattern raises the issue of whether fertility decline is necessarily slower at lower fertility levels.

With countries grouped by level of fertility in one period (and using all past periods back to the 1950s), figure III.10 indicates that this was the case. Total fertility fell by almost half a child in five years when it was initially at 4.0 children per woman to 4.9 children per woman. But once total fertility had reached 2.1 children per woman to 2.9 children per woman, the quinquennial decline was only a fifth of a child. At higher levels of fertility, the decline was also slower, so that from a level of 6.0 children per woman to 6.9 children per woman, the average quinquennial decline was also about a fifth of a child.

Figure III.8. Quinquennial change in total fertility, unweighted and weighted global averages, 1950-2005

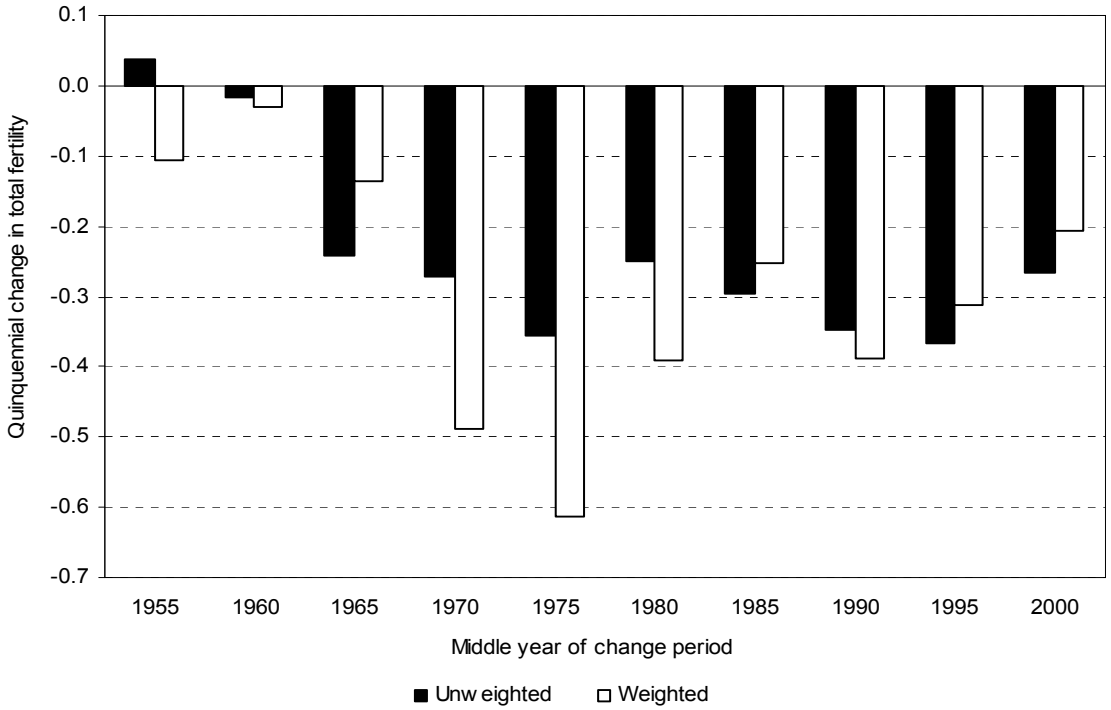


Figure III.9. Quinquennial change in total fertility in major world areas, 1950-2005

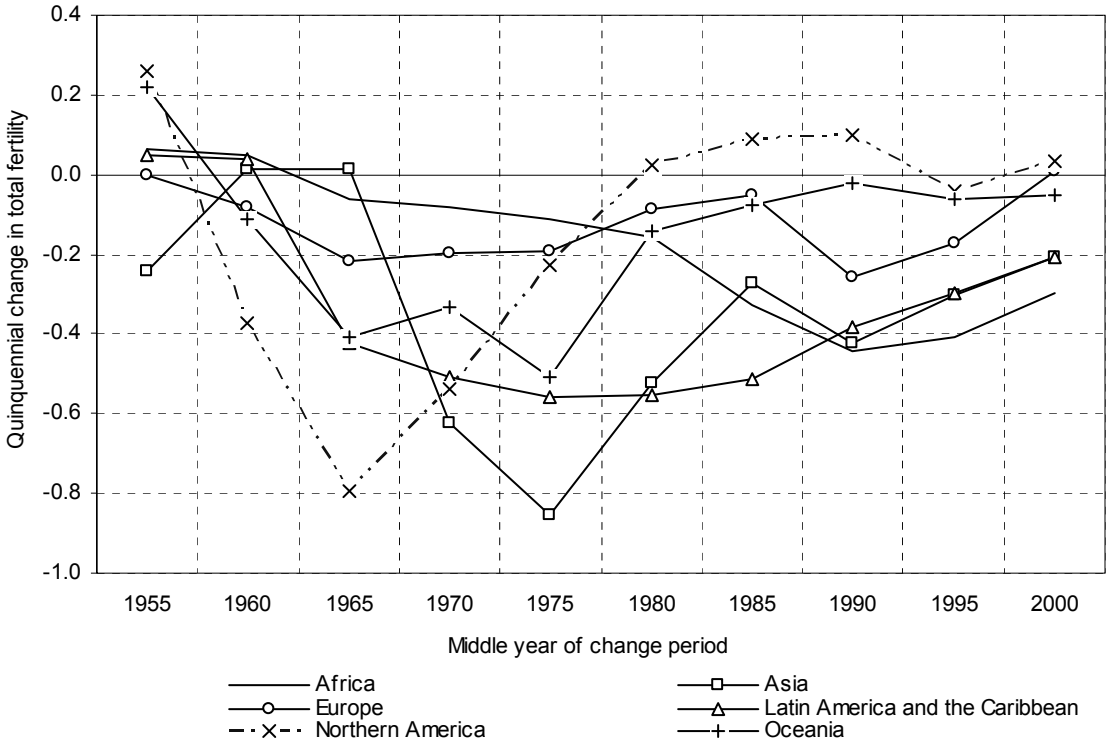
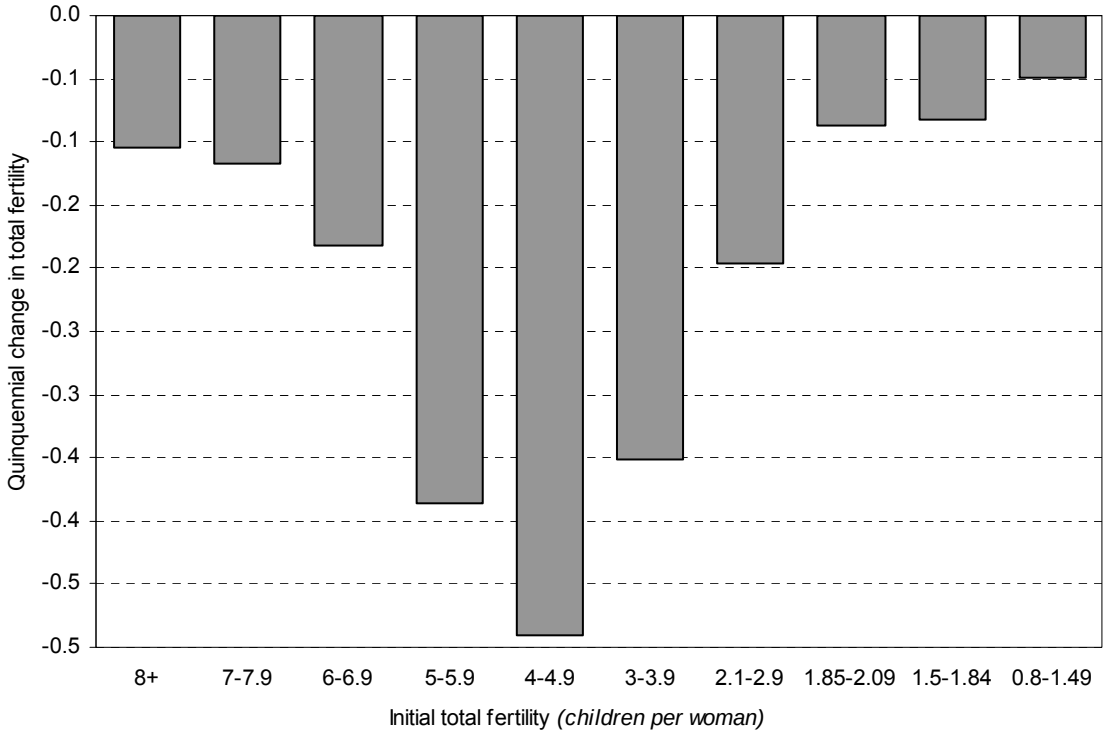


Figure III.10. Average quinquennial change in total fertility by initial level of total fertility across countries and years, 1950-2005



This pattern holds across major world areas (figure III.11). In each area, fertility decline has been greater when fertility was roughly between 6 children per woman and 3 children per woman. The European fertility trend no longer looks like a distinct pattern when initial fertility level is taken into account. The pattern for Northern America does look somewhat different, though with only two countries included, unusual variations are not averaged out. In Africa, accounting for initial total fertility levels still leaves rates of fertility decline lagging those in other regions.

About 1 per cent of fertility changes between quinquennia since 1960 were smaller than –1.3 points (table III.3). Declines this large are recorded, in Africa, for the mid-1960s in Mauritius, the 1980s and early 1990s in Libya and around 1990 in Rwanda. These are shown in figure III.12 in the context of the longer fertility trend in each country, with comparisons also provided to regional trends. The sharp declines started at different fertility levels, from 6 points to over 8 points. In the cases of Libya and Rwanda, the sharp declines may have partly compensated for a preceding rise in fertility and occurred when fertility levels were substantially above average fertility rates in the region. In none of the three cases was sharp fertility decline sustained for more than a decade. The decline continued afterwards, but the pace slowed.

In other regions, 17 countries have experienced similarly sharp fertility declines (figure III.13 to figure III.16). As with the three cases in Africa, there were some commonalities but also wide variation in circumstances. All but one of these sharp declines started above a fertility level of 4 children per woman. The exception was Cuba, which was just below 4 children per woman. Only one other case (besides Libya) lasted as long as a decade: Costa Rica, from around 1960 to around 1970. In only one instance did fertility rebound substantially: in Timor-Leste, where sharp decline accompanied civil unrest. Some declines started early, as in Grenada and Costa Rica around 1960 and some relatively late, as in Syria around 2000. Some sharp declines started well above regional averages, as if an outlier country was pulled downward toward a more typical pattern. Others started well below regional averages, as if a country was decidedly going its own way. Unlike average patterns of fertility change, which were represented above, sharp decline patterns are not easily susceptible to generalizations and may be less predictable.

Figure III.11. Quinquennial change in total fertility by initial level of total fertility, major world areas, 1950-2005

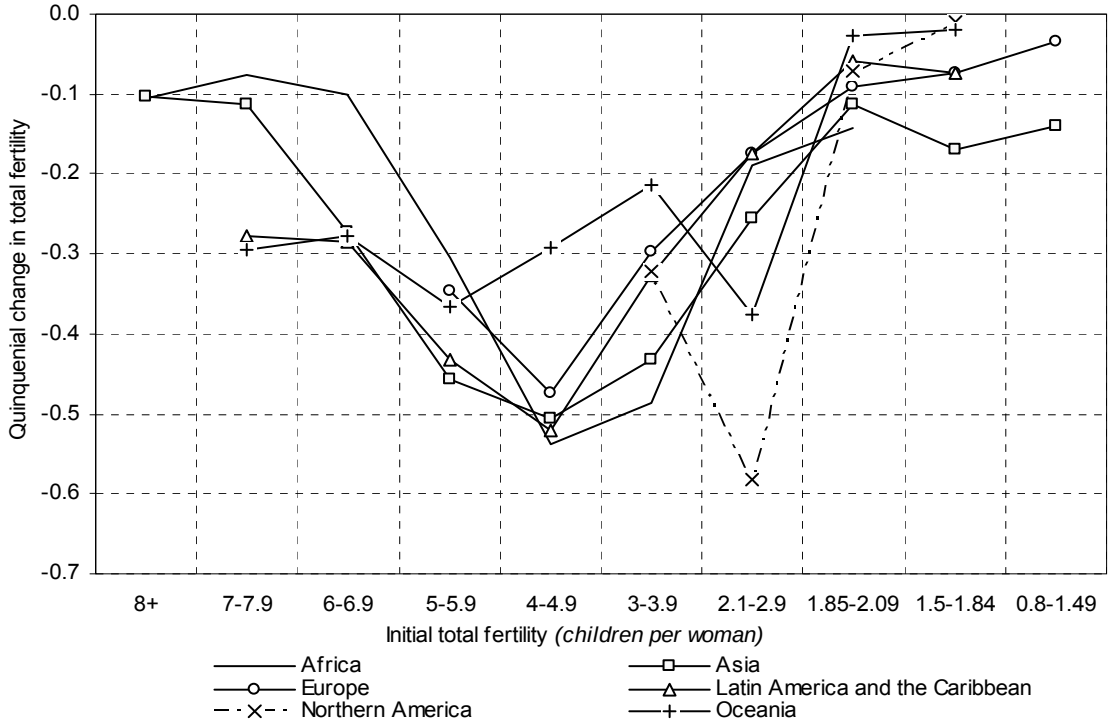


TABLE III.3. COUNTRIES WITH FERTILITY DECLINE EXCEEDING 1.3 CHILDREN PER WOMAN BETWEEN QUINQENNIA AT ANY POINT FROM 1950 TO 2005 AND MEAN QUINQUENNIAL DECLINES FROM THE HIGHEST ATTAINED FERTILITY LEVEL TO 2005

		Total fertility			*Period of highest total fertility*	*Mean change to 2005*
Country	*Period*	*Initial*	*Final*	*Change*		
China, Macao SAR	1960-1965 to 1965-1970	5.10	3.00	-2.10	1960-1965	-0.53
Timor-Leste	1970-1975 to 1975-1980	6.15	4.31	-1.85	1995-2000	-0.05
Iran (Islamic Republic of)	1990-1995 to 1995-2000	4.33	2.53	-1.79	1960-1965	-0.61
Maldives	1990-1995 to 1995-2000	5.55	3.85	-1.71	1975-1980	-0.84
Grenada	1960-1965 to 1965-1970	6.40	4.80	-1.60	1955-1960	-0.47
Libyan Arab Jamahiriya	1985-1990 to 1990-1995	5.65	4.10	-1.55	1970-1975	-0.76
China	1970-1975 to 1975-1980	4.86	3.32	-1.54	1950-1955	-0.45
Libyan Arab Jamahiriya	1980-1985 to 1985-1990	7.18	5.65	-1.53	1970-1975	-0.76
Mauritius	1960-1965 to 1965-1970	5.72	4.24	-1.48	1950-1955	-0.44
Singapore	1960-1965 to 1965-1970	4.93	3.46	-1.47	1950-1955	-0.50
Mongolia	1985-1990 to 1990-1995	4.83	3.37	-1.46	1970-1975	-0.88
Costa Rica	1965-1970 to 1970-1975	5.80	4.35	-1.46	1960-1965	-0.62
Cuba	1970-1975 to 1975-1980	3.60	2.15	-1.45	1960-1965	-0.38
Martinique	1970-1975 to 1975-1980	4.08	2.65	-1.43	1955-1960	-0.41
Guadeloupe	1970-1975 to 1975-1980	4.49	3.06	-1.43	1960-1965	-0.44
Costa Rica	1960-1965 to 1965-1970	7.22	5.80	-1.42	1960-1965	-0.62
Oman	1995-2000 to 2000-2005	5.10	3.70	-1.40	1980-1985	-0.87
Viet Nam	1975-1980 to 1980-1985	5.89	4.50	-1.39	1960-1965	-0.62
Syrian Arab Republic	1985-1990 to 1990-1995	6.24	4.86	-1.38	1965-1970	-0.59
Republic of Korea	1970-1975 to 1975-1980	4.28	2.92	-1.36	1955-1960	-0.57
Rwanda	1985-1990 to 1990-1995	8.25	6.90	-1.35	1980-1985	-0.62
Guam	1960-1965 to 1965-1970	6.03	4.72	-1.31	1960-1965	-0.40

NOTE: If highest fertility is recorded in more than one period, average decline is estimated from the last such period to 2005.

Figure III.12. Fertility declines in Africa faster than 1.3 points per quinquennium, compared with regional trends, 1950-2005

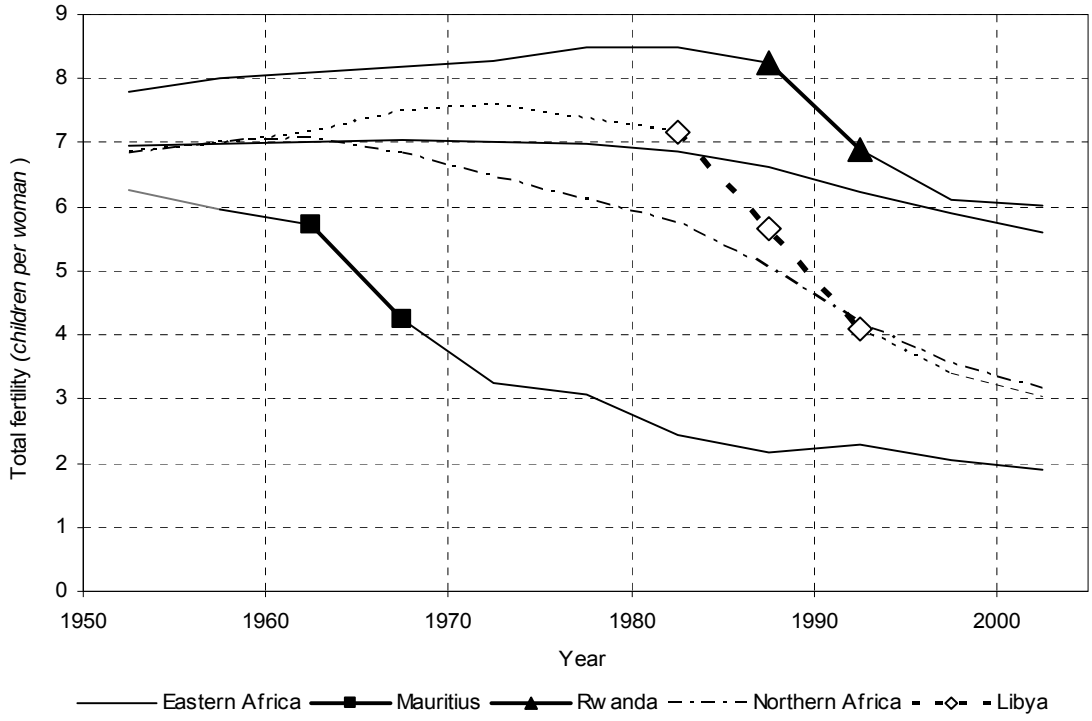


Figure III.13. Fertility declines in Western and South-Central Asia faster than 1.3 points per quinquennium compared with regional trends, 1950-2005

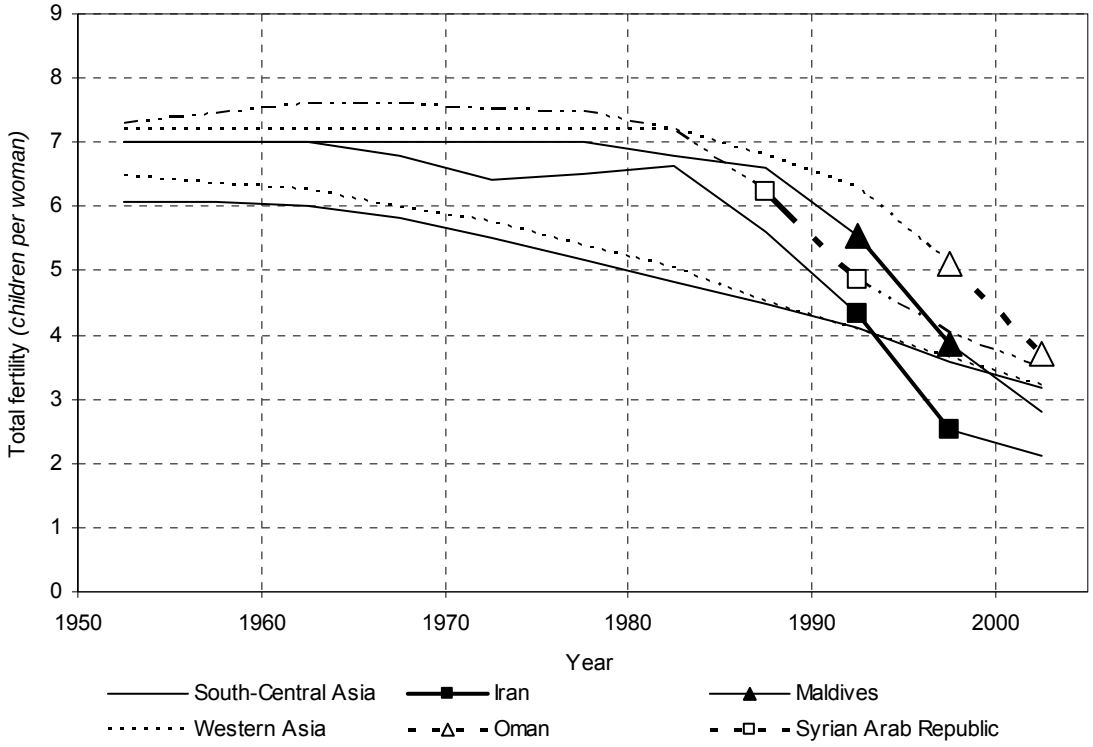


Figure III.14. Fertility declines in South-Eastern Asia and Oceania faster than 1.3 points per quinquennium, compared with regional trends, 1950-2005

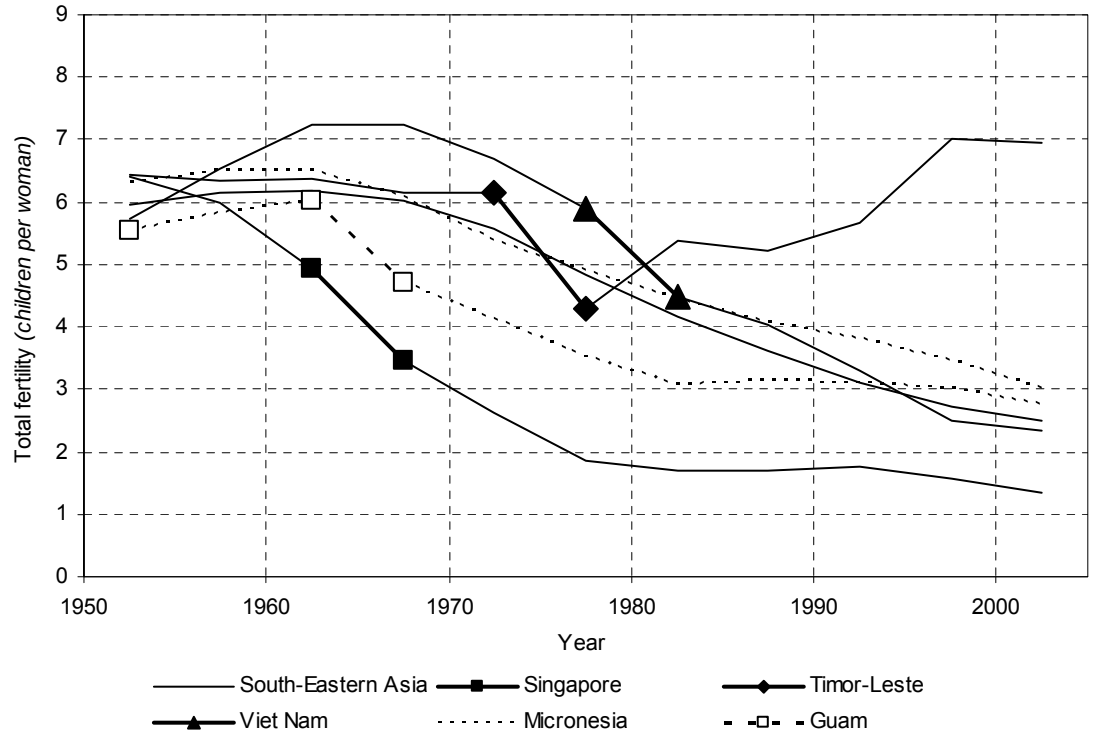


Figure III.15. Fertility declines in Eastern Asia faster than 1.3 points per quinquennium, compared with regional trends, 1950-2005

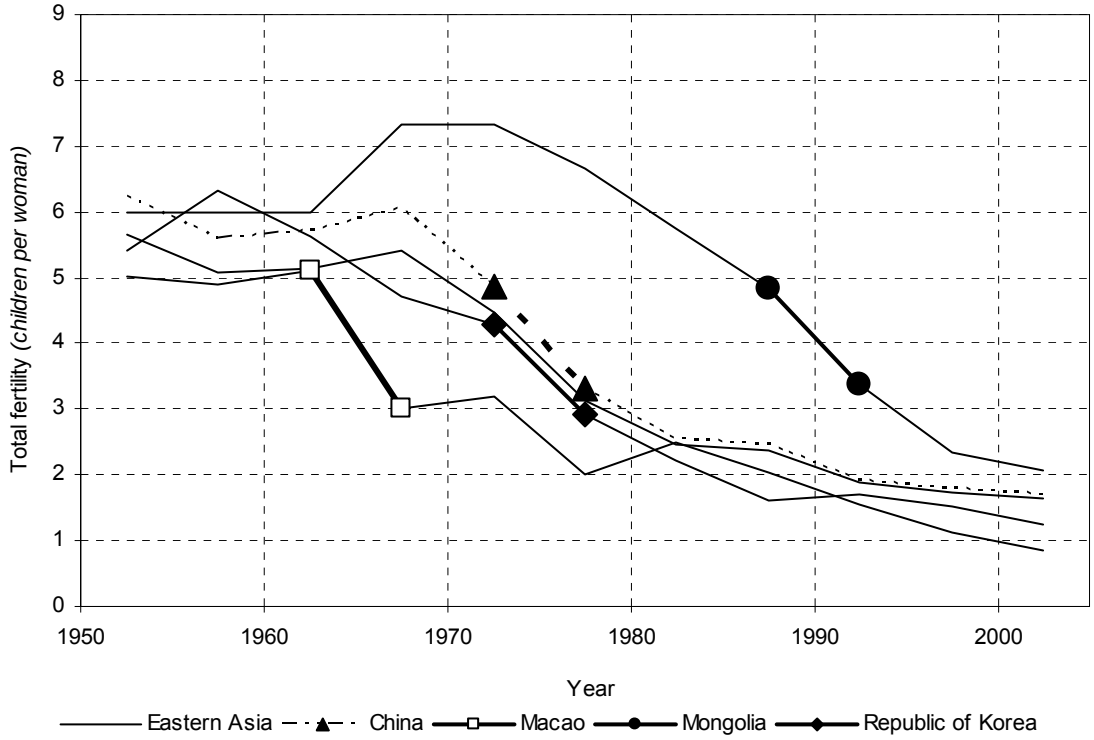
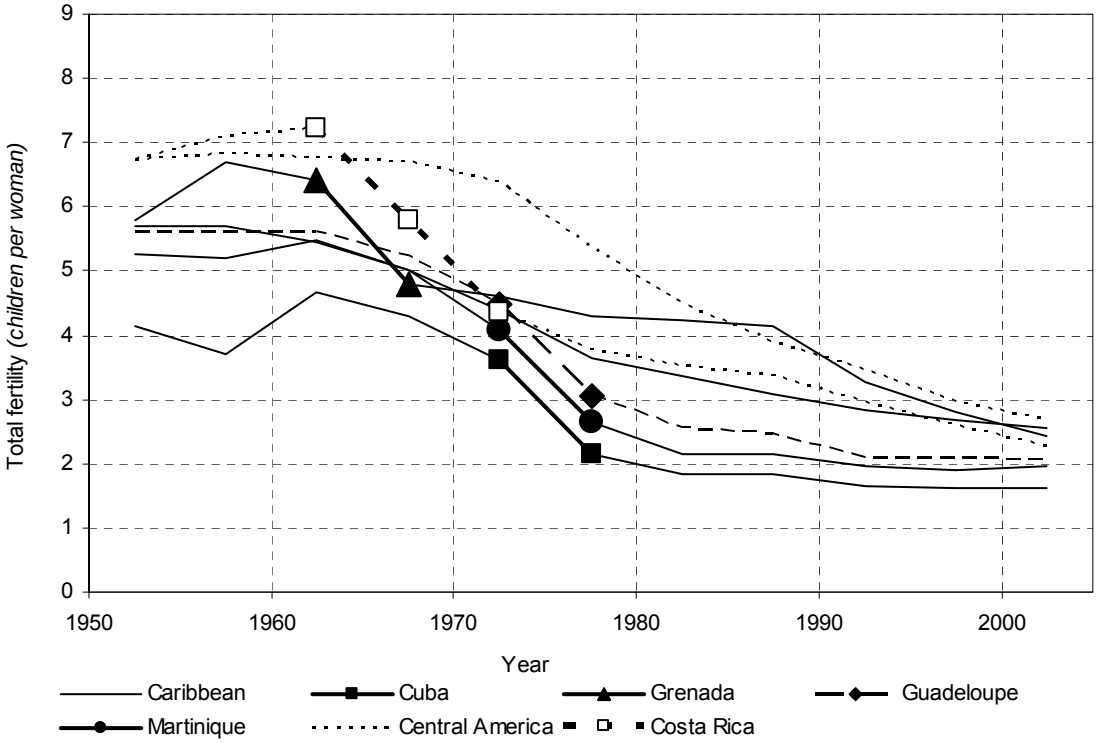


Figure III.16. Fertility declines in Latin America and the Caribbean faster than 1.3 points per quinquennium, compared with regional trends, 1950-2005



At the other extreme from rapid declines are countries where fertility stayed unchanged or actually rose. Between 1995-2000 and 2000-2005, fertility did not rise in any country where the level was above 2 children per woman, but in seven such countries, all in sub-Saharan Africa, it failed to show any change. In five of these cases (Burundi, the Democratic Republic of the Congo, Guinea-Bissau, Liberia and Sierra Leone), fertility was at least 6.5 children per woman and fertility transition had not started. But in some of these countries, the lack of up-to-date reliable data precludes any firm conclusions. The other two cases, Kenya and the United Republic of Tanzania, experienced stalls in fertility decline at 5.0 children per woman and 5.7 children per woman respectively. Such stalls may be noted from time to time in less developed regions. They have occurred at fertility levels from 7 children per woman down to 3 children per woman and seldom last more than one quinquennium.

At low fertility levels, where the only cases of rising fertility between 1995-2000 and 2000-2005 occurred, they were still outnumbered by instances of fertility decline. Fertility decrease is thus more common than fertility increase even at low levels.

Across all periods from 1960 to 2000, total fertility was below 2.5 children per woman in 306 cases (counting a country more than once if average fertility was below this level in more than one quinquennium). In 99 of these cases, fertility rose in the following period, but in twice as many cases it did not. For that subset of cases where fertility was below 2.0 children per woman, the percentage with subsequent increases was barely higher than 34 per cent. When fertility had fallen below 1.5 children per woman, it then rebounded still only 35 per cent of the time. Figure III.17 shows what happened at still lower levels of fertility. Only below the level of 1.2 children per woman did fertility decline appear more likely than not to reverse itself, but only six cases were involved. Four were European countries (Bulgaria, the Czech Republic, Latvia and Spain), all of which had higher fertility in the following period. Two essentially urban territories (Hong Kong, China, and Macao, China) had fertility decline continuing, below 1 child per woman. How much higher fertility will go in the four European countries, and indeed whether it will keep rising, is not known. With just these four countries over one period, even if one discounts the cases of Hong Kong, China, and Macao, China, there is little basis for generalization, which leaves a large area of uncertainty about future fertility in many countries that will reach low levels within the next half-century.

C. FUTURE FERTILITY

Given the apparently persistent trend of fertility decline, future fertility across countries is projected to move toward below replacement fertility at 1.85 children per woman (see table III.1, figure III.6 and figure III.7). But the process will not be quick and, as has been described, much population growth will take place in the meantime and even after eventual convergence.

In 2000-2005, fertility across regions ranged from 6.2 children per woman to 1.3 children per woman. By 2020-2025, the spread will be between 4.8 children per woman and 1.4 children per woman (figure III.18). By 2045-2050, the spread will be the narrowest since at least 1950, between 2.8 children per woman and 1.7 children per woman. Highest fertility in 2045-2050 will be in Middle Africa, as it was in 2000-2005 and lowest fertility will be in Eastern Europe, again as in 2000-2005.

These projections assume that fertility will not fall continuously but will stabilize slightly below replacement at 1.85 children per woman. Where it is below, it will increase slowly towards 1.85 children per woman.

The 12 highest fertility countries in 2000-2005, 10 sub-Saharan African countries plus Afghanistan and Timor-Leste, will still be the 12 highest in 2045-2050. Their total fertility ranges from 6.5 children per woman to 7.5 children per woman in 2000-2005, well above even the average for least developed countries (which was 4.95 children per woman). By 2045-2050 they will still be between 2.8 children per woman and 3.8 children per woman, while the average for least developed countries will be 2.5 children per woman. One consequence: while the population of least developed countries will increase 127 per cent from 2005 to 2050, population in these 12 highest fertility countries will increase 210 per cent (details not shown).

Figure III.17. Cases where total fertility was below 1.4 children per woman in 1960-2000 and subsequent fertility level

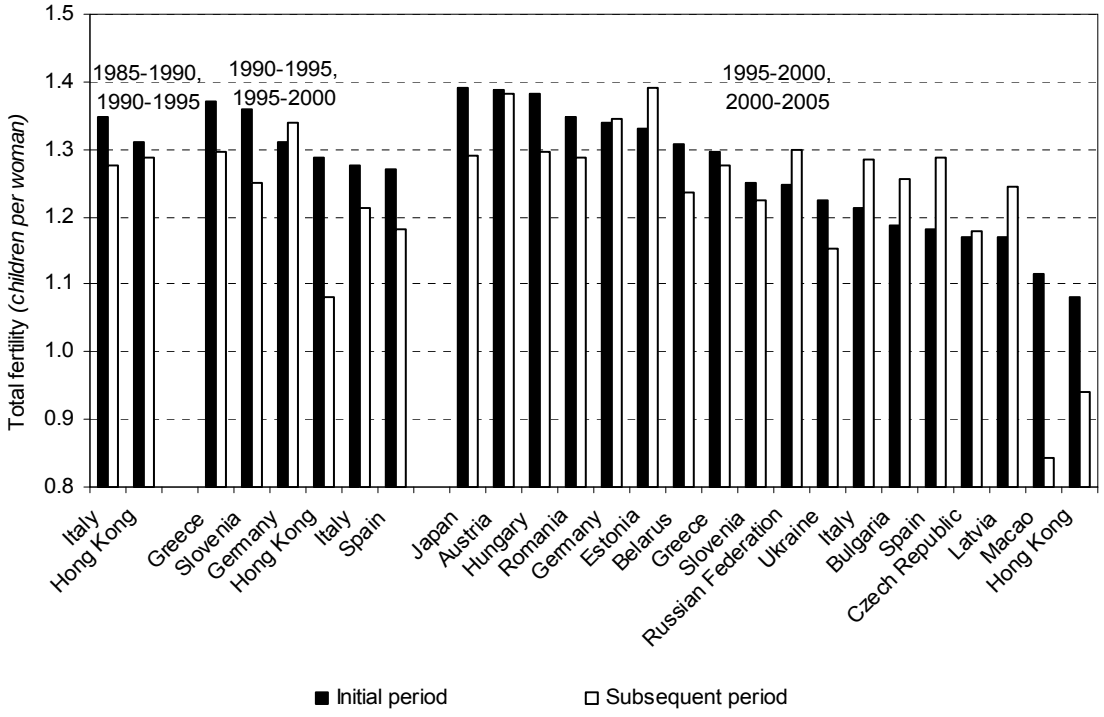
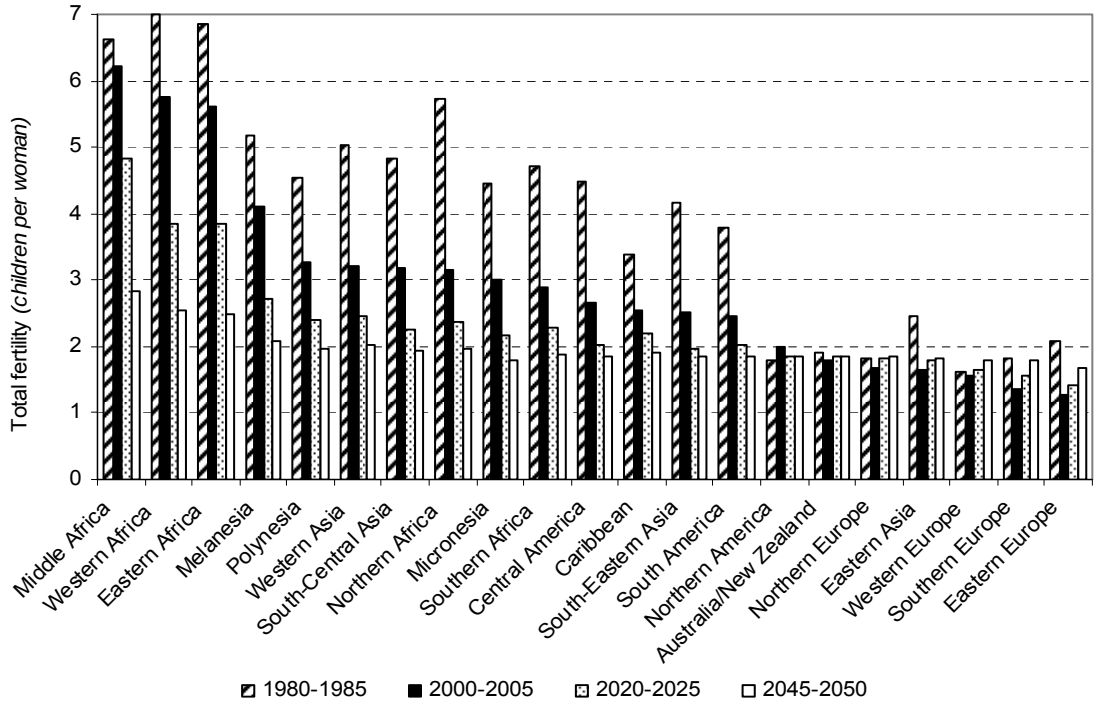


Figure III.18. Total fertility for regions, selected periods



Rankings of the lowest fertility countries in the future also tend to be stable beginning in 2005. The 12 lowest fertility countries, unchanged between 2005 and 2050, will be in Eastern Asia and Eastern Europe, with the addition of Singapore, Bosnia and Herzegovina and Lithuania. (In 2000-2005, Bulgaria, Latvia and Slovenia were among the 12 in place of Japan, Singapore and Bosnia and Herzegovina). Total fertility in these countries was below 1.3 children per woman in 2000-2005 and will rise no higher than 1.7 children per woman by 2045-2050. Despite these very low fertility levels, the three predominantly urban members of this group will avoid losing population, mainly through migration. Hong Kong, China, will grow 27 per cent from 2005 to 2050, Singapore 16 per cent, and Macao, China, 11 per cent—in each case well above the average increase in more developed regions of 2.4 per cent. The other nine countries will lose between 12 per cent and 34 per cent of population, in contrast to the European average of 9 per cent (details not shown).

Whereas more developed regions in the aggregate reached replacement fertility around 1972, other less developed countries will not reach that level till around 2017 and least developed countries not till after mid-century (table III.4). Within five years of reaching replacement, fertility in Western Europe fell below the level of 1.85 children per woman, the level used in the projections as the levels where fertility stabilizes in the long-run (figure III.19). Northern America reached replacement fertility at about the same time as Western Europe, but fertility is not projected to reach 1.85 children per woman until 2023. Eastern Asia resembles Western Europe in the sense of having a short lag between reaching replacement, in 1989 and reaching a level of 1.85 children per woman, in 1994. But the majority of other less developed regions are projected to follow the North American pattern, with a long lag from reaching replacement, between 2015 and 2040 and attaining the lower level of 1.85 children per woman. (The three tropical regions of sub-Saharan Africa are exceptions in that they will not reach replacement fertility within a half century). Whereas the long lag avoids sharp changes in age structure, it also contributes to population growth, which continues because of population momentum after replacement fertility is reached. In Europe, zero population growth was not attained until 25 to 30 years after replacement fertility. It may take as long or longer, certainly past mid-century, in the majority of less developed regions.

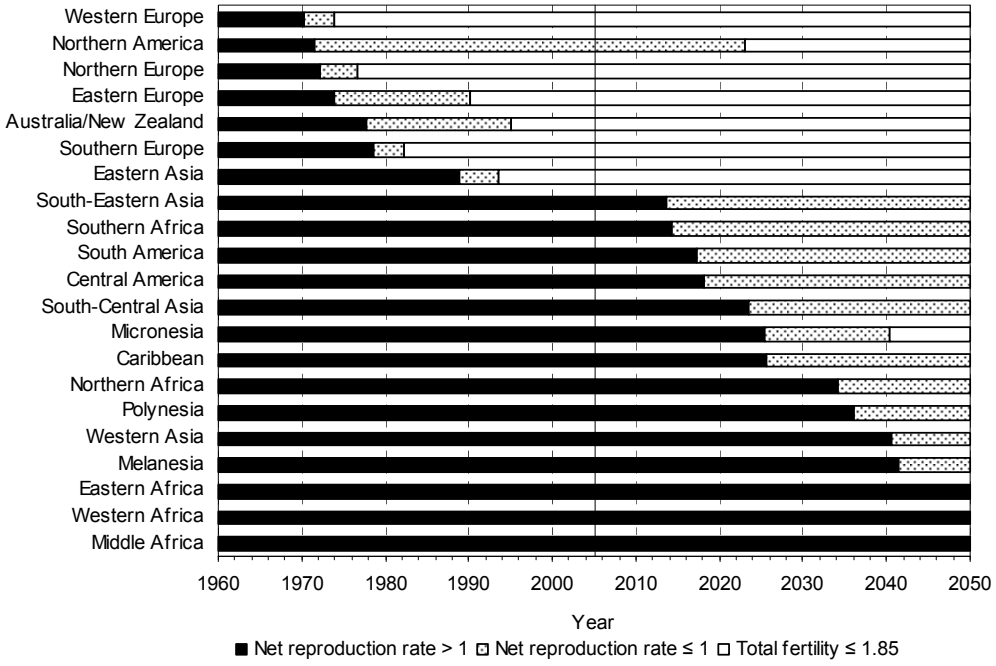
Achieving zero population growth worldwide in the next half century, if that were the goal, would require world fertility to be below replacement level. For fertility in every country to move immediately to replacement and stay at that level during the projection period would not only allow population to continue to grow due to the inherent growth momentum caused by still young populations, but would even produce slightly greater growth than in the medium projection. An alternative scenario using this assumption produces a world of 9.33 billion rather than 9.19 billion by 2050. This is because many countries are already below replacement fertility—71 countries as of 2000-2005. If only those counties that are above replacement level moved to that level and stayed at that level indefinitely, there would indeed be some reduction in population growth. However, population would still increase to 8.61 billion by 2050. This is 6 per cent below the medium projection, a small reduction, much smaller than the reduction from replacing the medium with the low scenario (details not shown).

TABLE III.4. PROJECTED TOTAL FERTILITY FOR REGIONS AND ESTIMATED YEAR WHEN IT REACHES REPLACEMENT LEVELS AND THE LONG-TERM EQUILIBRIUM LEVEL OF 1.85 CHILDREN PER WOMAN

	Period						*Year when fertility reaches:*	
Major area and region	*2000-2005*	*2010-2015*	*2020-2025*	*2030-2035*	*2040-2045*	*2045-2050*	*Replacement level*	*1.85 children per woman*
Africa								
Eastern Africa	5.60	4.79	3.85	3.12	2.65	2.47	..	..
Middle Africa	6.21	5.70	4.84	3.92	3.13	2.84	..	..
Northern Africa	3.16	2.67	2.37	2.15	2.01	1.96	2034	..
Southern Africa	2.90	2.53	2.27	2.08	1.93	1.88	2014	..
Western Africa	5.77	4.79	3.84	3.17	2.72	2.55	..	..
Asia								
Eastern Asia	1.66	1.72	1.80	1.81	1.82	1.83	1989	1994
South-Central Asia	3.19	2.64	2.27	2.01	1.95	1.93	2024	..
South-Eastern Asia	2.51	2.16	1.98	1.90	1.86	1.86	2014	..
Western Asia	3.22	2.80	2.45	2.21	2.07	2.03	2041	..
Europe								
Eastern Europe	1.26	1.32	1.42	1.52	1.62	1.68	1974	1990
Northern Europe	1.69	1.81	1.82	1.83	1.84	1.84	1972	1977
Southern Europe	1.36	1.48	1.56	1.65	1.74	1.79	1979	1982
Western Europe	1.58	1.59	1.66	1.72	1.77	1.80	1970	1974
Latin America and the Caribbean								
Caribbean	2.56	2.33	2.20	2.05	1.95	1.91	2026	..
Central America	2.67	2.28	2.04	1.95	1.88	1.85	2018	..
South America	2.47	2.21	2.02	1.89	1.86	1.85	2017	..
Northern America	1.99	1.97	1.85	1.84	1.85	1.85	1972	2023
Oceania								
Australia/New Zealand	1.79	1.85	1.85	1.85	1.85	1.85	1978	1995
Melanesia	4.10	3.24	2.73	2.41	2.18	2.09	2041	..
Micronesia	3.01	2.47	2.17	1.97	1.82	1.78	2025	2040
Polynesia	3.28	2.79	2.42	2.15	2.01	1.97	2036	..

NOTE: Fertility does not reach this level before 2050.

Figure III.19. Period between 1960 and 2050 that each region is above replacement fertility, just below replacement and at total fertility of 1.85 children per woman or lower



IV. MORTALITY

In the modern world, a longer life than one's parents seems almost a birthright. But it is not one that everyone can claim. Longer lives are elusive in some societies, with their unsanitary living conditions and decrepit health systems and the threats of unrest and modern epidemics. Longer lives may themselves exert pressure on societies, requiring difficult adjustments.

The first issue to consider in this chapter is: how long life is, how this varies, how it has changed or failed to change and what increase in life expectancy are projected for the future. Then this chapter considers how mortality and survival vary across the life cycle, from infants to older people. Behind the trends and variations are many factors, but a specific threat is considered next: the HIV/AIDS epidemic and what effects it is having and will have on mortality patterns.

A. LIFE EXPECTANCY

A woman expecting a baby in 2000-2005 could expect her child to live 66.0 years, based on global mortality rates across all ages and for both sexes (figure IV.1). Were the baby a boy, life expectancy would have been lower than the average, at 63.9 years and were it a girl, slightly higher, 68.3 years. This gap of four-and-a-half years is typical around the world and not large when compared to gaps between or in countries. In more developed regions, life expectancy at birth on average of 75.6 years for both sexes is almost a quarter century longer than life expectancy in the least developed countries and almost a decade longer than life expectancy in other less developed countries (table IV.1).

Figure IV.1. Life expectancy at birth, world and development groups, 2000-2005

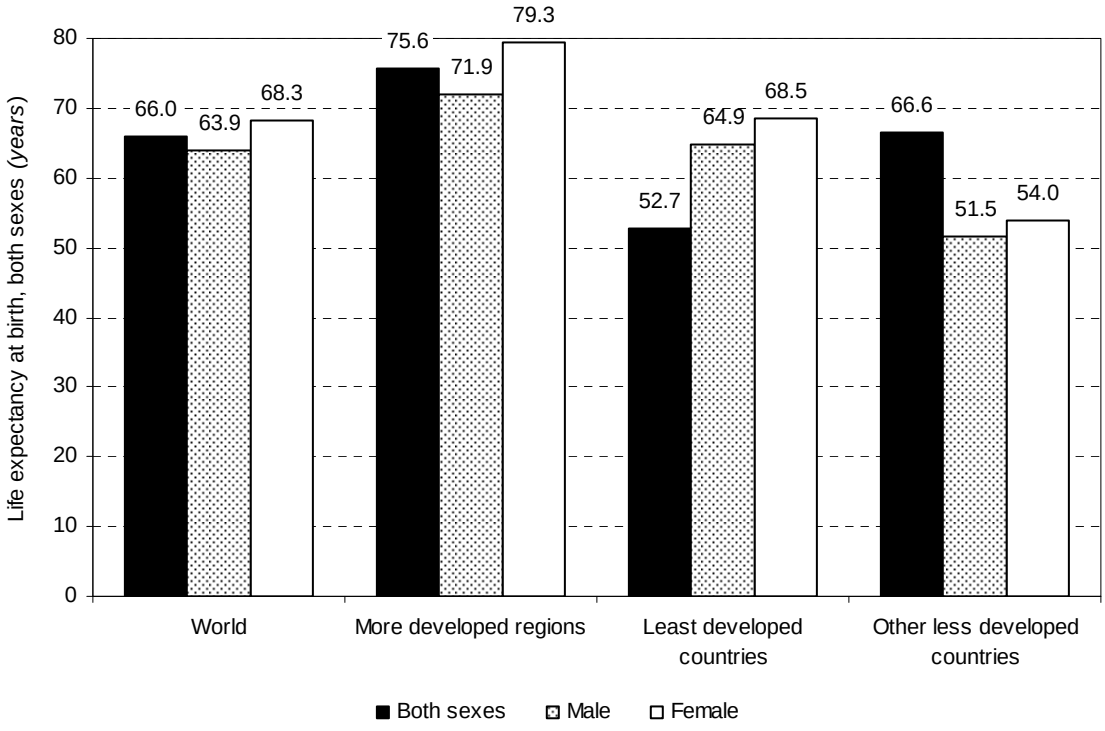


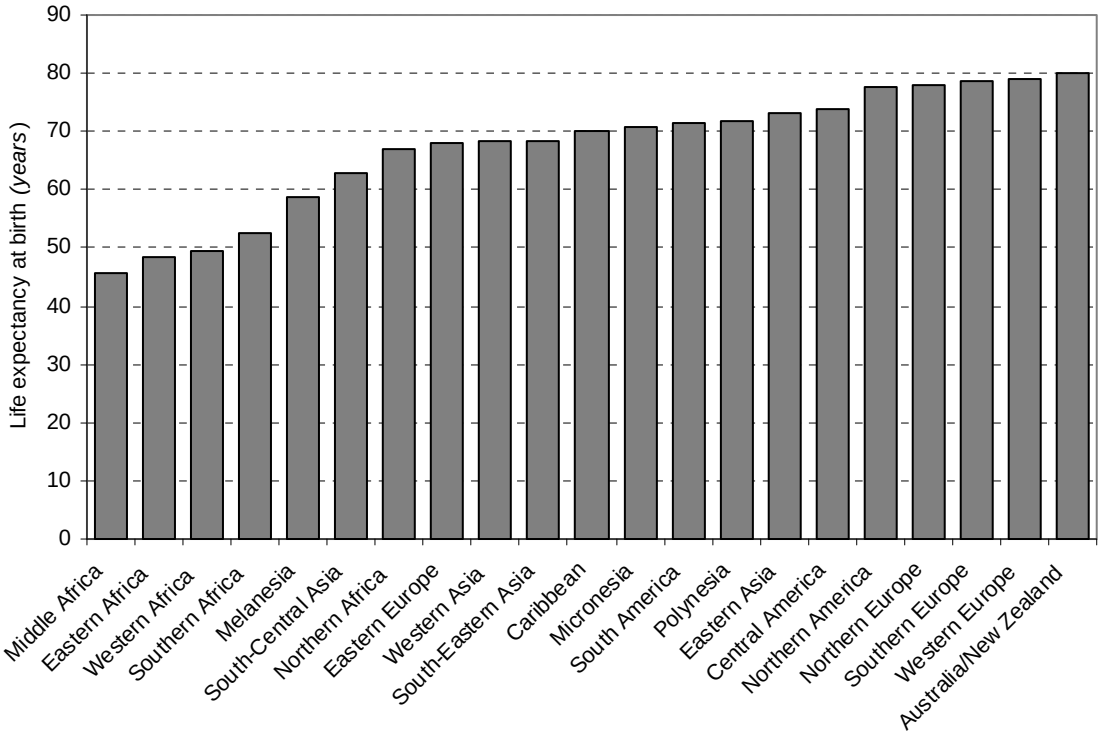
TABLE IV.1. LIFE EXPECTANCY AT BIRTH (BOTH SEXES) FOR THE WORLD, DEVELOPMENT GROUPS, MAJOR WORLD AREAS AND REGIONS, SELECTED PERIODS *(years)*

Development group or major world area and region	*1950-1955*	*1960-1965*	*1970-1975*	*1980-1985*	*1990-1995*	*2000-2005*	*2020-2025*	*2045-2050*
World	**46.4**	**52.2**	**58.3**	**61.6**	**64.2**	**66.0**	**70.9**	**75.4**
More developed regions	66.1	69.8	71.3	72.8	74.0	75.6	79.0	82.4
Less developed regions	40.8	47.4	55.0	58.8	62.0	64.1	69.4	74.3
Least developed countries	36.2	40.5	44.6	48.3	50.4	52.7	59.8	67.2
Other less developed countries	41.5	48.5	56.7	60.7	64.2	66.6	71.8	76.4
Africa	**38.5**	**42.8**	**46.8**	**50.3**	**51.9**	**51.6**	**58.1**	**66.1**
Eastern Africa	37.4	42.3	46.3	48.7	48.4	48.4	57.0	65.3
Middle Africa	37.1	40.7	44.9	47.8	47.2	45.8	52.1	61.4
Northern Africa	41.8	46.4	51.1	57.0	62.8	67.1	72.4	76.7
Southern Africa	44.7	49.7	53.4	58.0	61.7	52.5	54.0	62.4
Western Africa	36.4	39.9	43.5	47.1	49.3	49.4	55.9	64.8
Asia	**41.0**	**48.0**	**56.6**	**60.7**	**64.5**	**67.5**	**73.0**	**77.4**
Eastern Asia	42.9	51.4	64.2	66.8	69.9	73.2	76.8	79.9
South-Central Asia	38.4	44.2	50.5	56.0	60.0	62.7	69.5	75.0
South-Eastern Asia	40.9	46.7	52.3	58.7	64.2	68.5	74.4	78.6
Western Asia	45.2	51.8	57.1	62.3	65.7	68.3	74.1	78.3
Europe	**65.6**	**69.8**	**70.9**	**71.7**	**72.6**	**73.8**	**77.4**	**81.0**
Eastern Europe	64.2	69.3	69.6	68.6	68.2	67.8	71.6	75.9
Northern Europe	69.2	71.2	72.4	74.1	75.6	78.0	81.0	83.9
Southern Europe	63.4	68.6	71.5	74.1	76.1	78.6	81.3	84.1
Western Europe	67.6	70.7	71.8	74.3	76.6	79.0	81.7	84.5
Latin America and the Caribbean	**51.4**	**56.8**	**60.9**	**65.0**	**68.6**	**72.0**	**76.3**	**79.6**
Caribbean	52.3	58.5	63.0	65.3	67.6	70.0	74.4	78.4
Central America	49.2	56.4	61.0	65.6	70.2	73.8	77.8	80.3
South America	52.0	56.7	60.5	64.8	68.2	71.6	76.0	79.5
Northern America	**68.8**	**70.1**	**71.6**	**74.3**	**75.5**	**77.6**	**80.3**	**83.3**
Oceania	**60.4**	**63.7**	**65.8**	**70.1**	**72.3**	**74.4**	**77.7**	**81.1**
Australia/New Zealand	69.6	70.9	71.7	75.0	77.4	80.2	83.2	85.9
Melanesia	37.4	42.7	47.7	55.0	57.3	58.9	63.3	69.4
Micronesia	53.2	57.3	61.4	64.6	67.6	70.7	75.0	79.1
Polynesia	50.4	56.1	60.5	64.9	68.8	71.8	75.8	79.3

1. Regional variation

In 2000-2005 across regions, life expectancy for both sexes ranged from 80.2 years in Australia/New Zealand to only 45.8 years in Middle Africa (figure IV.2). Within major world areas, regional variation in life expectancies can be as long as a decade. The three tropical regions of sub-Saharan Africa had life expectancies below 50 years; Southern Africa was slightly higher at 52.5 years; but Northern Africa was considerably higher at 67.1 years. Oceania includes Melanesia, where life expectancy was 58.9 years, considerably shorter than in Australia/New Zealand. Life expectancy in South-Central Asia was 62.7 years, but in Eastern Asia, 73.2 years. Even within Europe, a disparity of more than a decade separates life expectancies in Eastern and Southern Europe.

Figure IV.2. Life expectancy at birth (both sexes), regions, 2000-2005



The shortest life expectancies in any country in 2000-2005, at around 40 years, were in Zambia and Zimbabwe (table IV.2). Twelve countries in all had life expectancies below 45 years, eleven of them in sub-Saharan Africa and Afghanistan (figure IV.3). Six of these 12 countries had higher life expectancies in the preceding quinquennium —implying some catastrophe they had in common (e.g., AIDS mortality crisis). At the opposite end of the scale, 14 countries had life expectancies longer than 79 years in 2000-2005, led by Japan at 81.9 years and Hong Kong SAR China, at 81.5 years. Seven of the 14 countries were European, led by Iceland and Switzerland. The others were scattered around the globe, from Australia to Canada to Israel. (figure IV.4, which shows these countries, is drawn to a very different scale from the previous figure).

At high levels of life expectancy, countries are bunched fairly closely, though rankings remain relatively stable over time (table IV.2). The greatest gain in this group from 1995-2000 to 2000-2005 was in Iceland. Life expectancy rose 1.8 years and its rank went from fifth highest to third highest. The smallest gain—none lost years of life—was 0.8 years in Sweden, which accordingly fell from fourth to sixth.

These changes in life expectancy are small relative to those at the other end of the scale (see table IV.2 and figure IV.3). The largest gain for any of the 195 countries from 1995-2000 to 2000-2005 was in Rwanda, where life expectancy rose 7.3 years (starting to partially recovering from the 1994 genocide), so that Rwanda was no longer the lowest but the seventh lowest (but even after a decade life expectancy remained lower than before the genocide). Within the last decade, the two largest losses for any country were in Lesotho, of 11.0 years and Swaziland, of 10.4 years, moving them into the group of 12 lowest from previous rankings of 37th and 31st respectively. Zimbabwe also had one of the largest losses in life expectancy of 6.8 years and its rank went from 14th to second. Again, the impact of the HIV/AIDS epidemic on mortality in Southern Africa is strong.

TABLE IV.2. TEN COUNTRIES AND AREAS WITH THE LOWEST AND TEN COUNTRIES AND AREAS WITH THE HIGHEST LIFE EXPECTANCY AT BIRTH (BOTH SEXES) IN 2000-2005, SELECTED PERIODS*(years)*

Country	*1980-1985*	*1985-1990*	*1990-1995*	*1995-2000*	*2000-2005*	*2020-2025*	*2045-2050*
Lowest life expectancy at birth							
Zambia	51.8	50.8	46.1	40.2	39.2	48.3	57.4
Zimbabwe	60.4	62.4	60.4	46.8	40.0	53.0	64.2
Angola	39.9	39.9	40.6	41.0	41.0	48.3	58.2
Sierra Leone	38.4	40.0	38.3	39.9	41.0	47.1	56.8
Afghanistan	39.9	40.8	41.7	41.8	42.1	49.0	58.7
Central African Rep.	48.3	50.5	49.4	46.1	43.3	49.5	58.6
Rwanda	46.2	44.0	23.6	36.1	43.4	52.8	61.9
Liberia	44.9	46.0	40.8	42.2	43.8	51.2	60.5
Swaziland	55.6	57.7	58.5	54.3	43.9	44.2	53.9
Mozambique	42.8	42.9	44.3	46.3	44.0	47.5	57.2
Highest life expectancy at birth							
Canada	75.9	77.0	77.9	78.7	79.8	82.6	85.3
Italy	74.5	76.2	77.3	78.7	79.9	82.3	85.0
China, Macao SAR	74.0	76.0	77.3	78.8	80.0	82.8	85.7
Spain	75.8	76.6	77.4	78.6	80.0	82.7	85.4
Sweden	76.3	77.3	78.2	79.3	80.1	82.7	85.2
Australia	75.2	76.1	77.6	78.7	80.4	83.3	86.0
Switzerland	76.2	77.4	77.8	79.4	80.7	83.4	86.1
Iceland	76.8	77.8	78.6	79.3	81.0	83.4	86.1
China, Hong Kong SAR	75.5	76.2	77.6	80.0	81.5	83.9	86.7
Japan	76.9	78.3	79.5	80.5	81.9	84.7	87.1

Figure IV.3. Countries with life expectancies below 45 years in 2000-2005

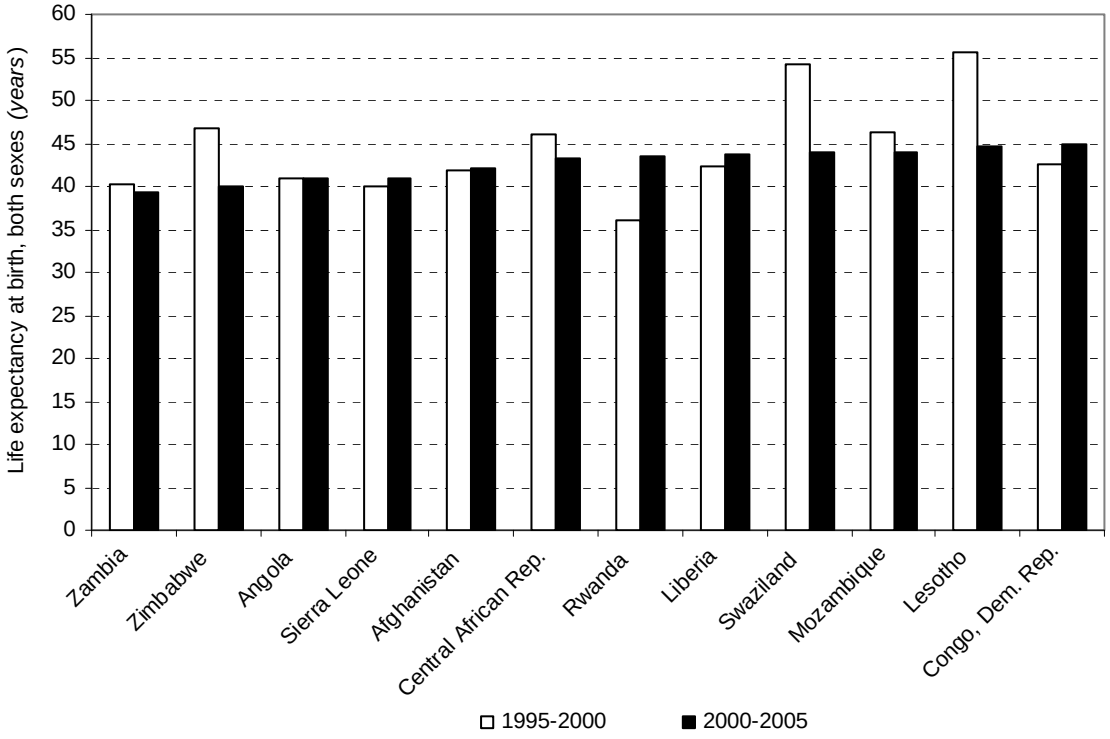
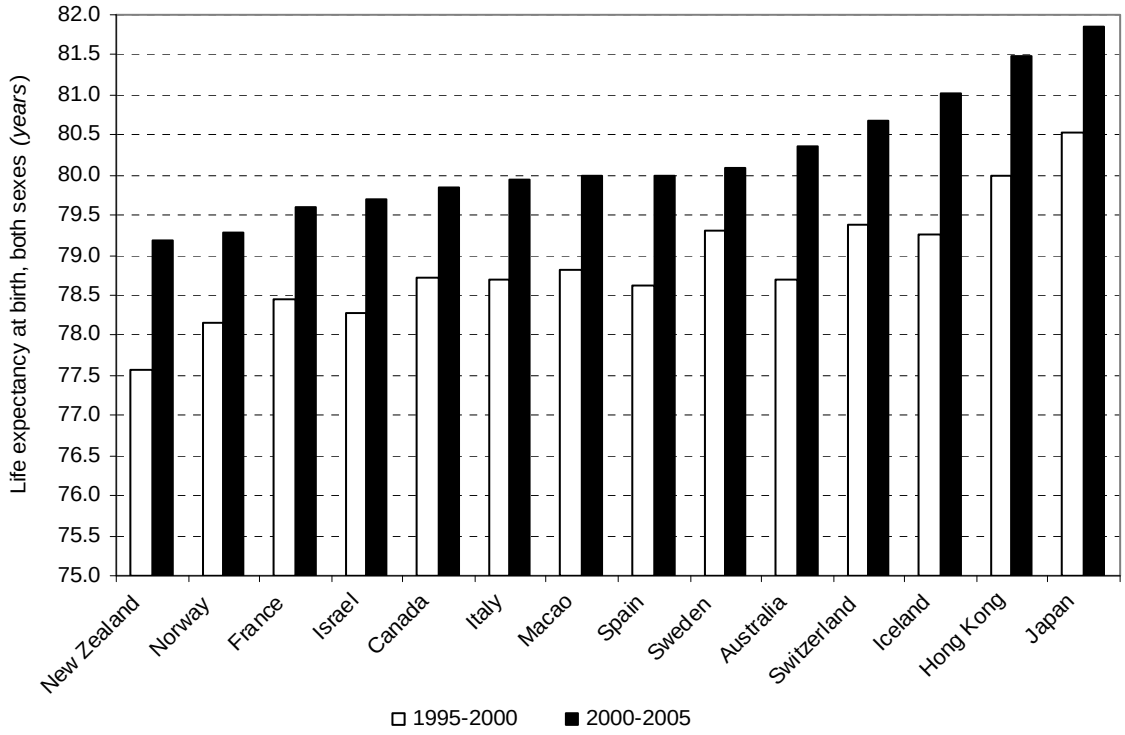


Figure IV.4. Countries with life expectancies above 79 years in 2000-2005



Global trends in life expectancy look smooth, concealing large variations (table IV.1 and figure IV.5). Globally, life expectancy for both sexes rose 4.5 years between 1980-1985 and 2000-2005, or 1.1 years each quinquennium. The rise was smaller in more developed regions (0.7 years per quinquennium), larger in the least developed countries (1.1 years per quinquennium) and largest in other less developed countries (1.5 years per quinquennium). These increases were larger than increases in the previous two decades.

For some regions, past trends in life expectancy did in fact show fairly constant or at least monotonic gains (table IV.1). Eleven of these regions are shown in figure IV.6. Life expectancy in Western Europe, Northern Europe and Northern America rose, in each case, from 67-69 years in 1950-1955 to 78-79 years in 2000-2005. Central America, South America, Polynesia and Micronesia were each in the range of 49-54 years in 1950-1955 and, progressing faster than more developed regions, reached 71-74 years by 2000-2005. The next three regions were all in Asia. Western Asia gained about the same number of years as the previous four regions but started lower, at only 45 years. South-Eastern Asia, in contrast, started four years further down but reached the level attained by Western Asia by 2000-2005. South-Central Asia was at a still lower level in 1950-1955 and did not gain any ground on Western Asia, but it did not lose any either. The last region in the figure, Western Africa, gained fewer years of life expectancy than the other less developed regions through 1990 and then gains largely stopped.

The remaining regions, with somewhat more erratic trends, are shown in figure IV.7. Three developed regions other than those previously shown have somewhat different trends. Life expectancy in Australia/New Zealand has risen slightly faster than in other more developed regions, so by 2000-2005 life expectancy was a year-and-a-half higher than in other regions. Southern Europe closed a gap of four to six years with other European regions between 1950 and 1970 and since then has progressed at the same rate as these other regions. Eastern Europe was on the way to bridging a similar gap, but in the mid-1960s, life expectancy stopped rising and stagnated, with a slight decline since then.

Figure IV.5. Life expectancy for the world and development groups, 1950-2050

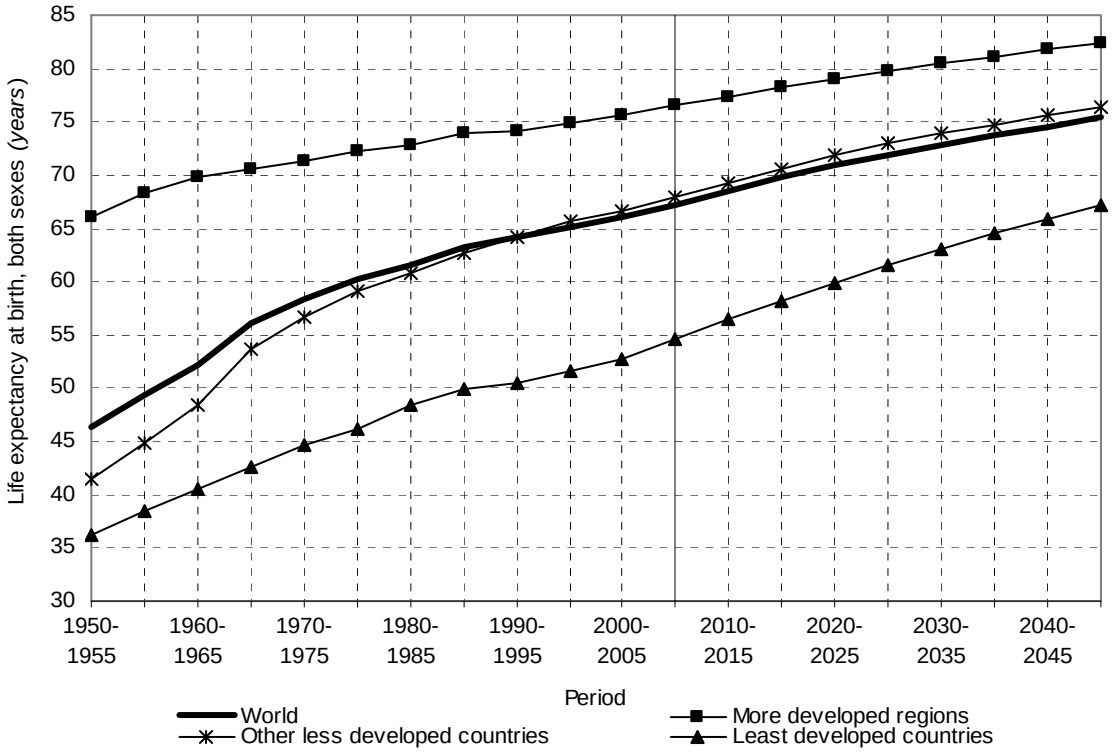


Figure IV.6. Life expectancy in regions, 1950-2005: smoother trends

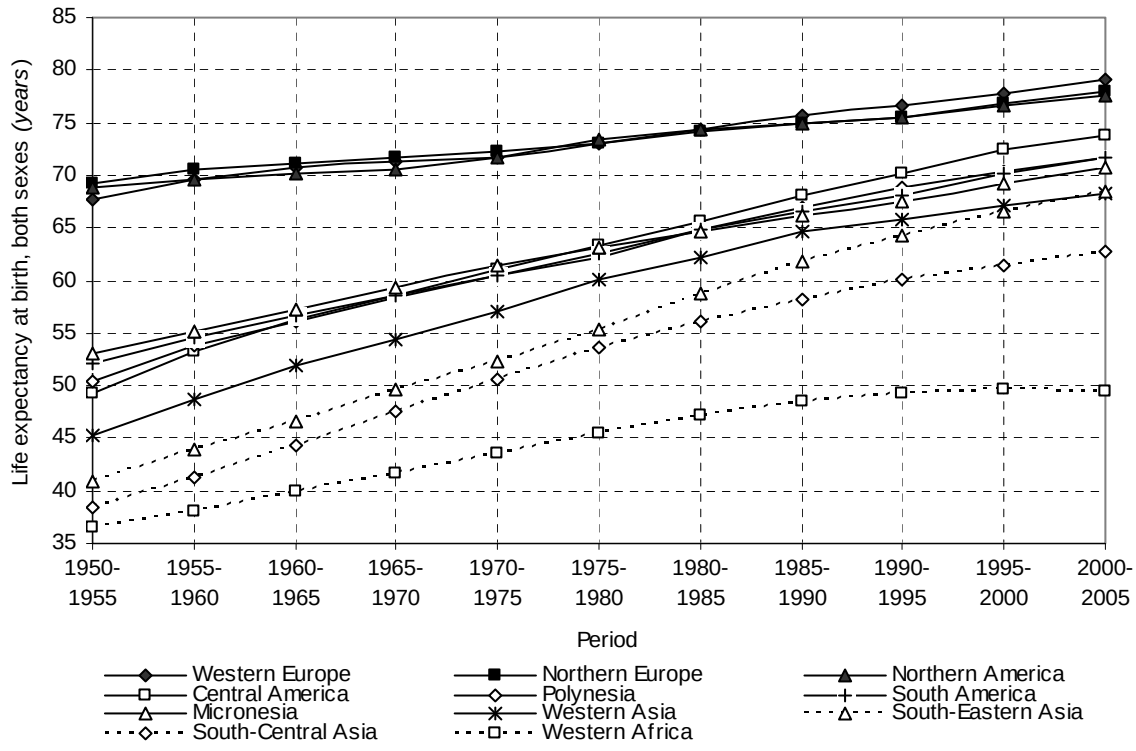
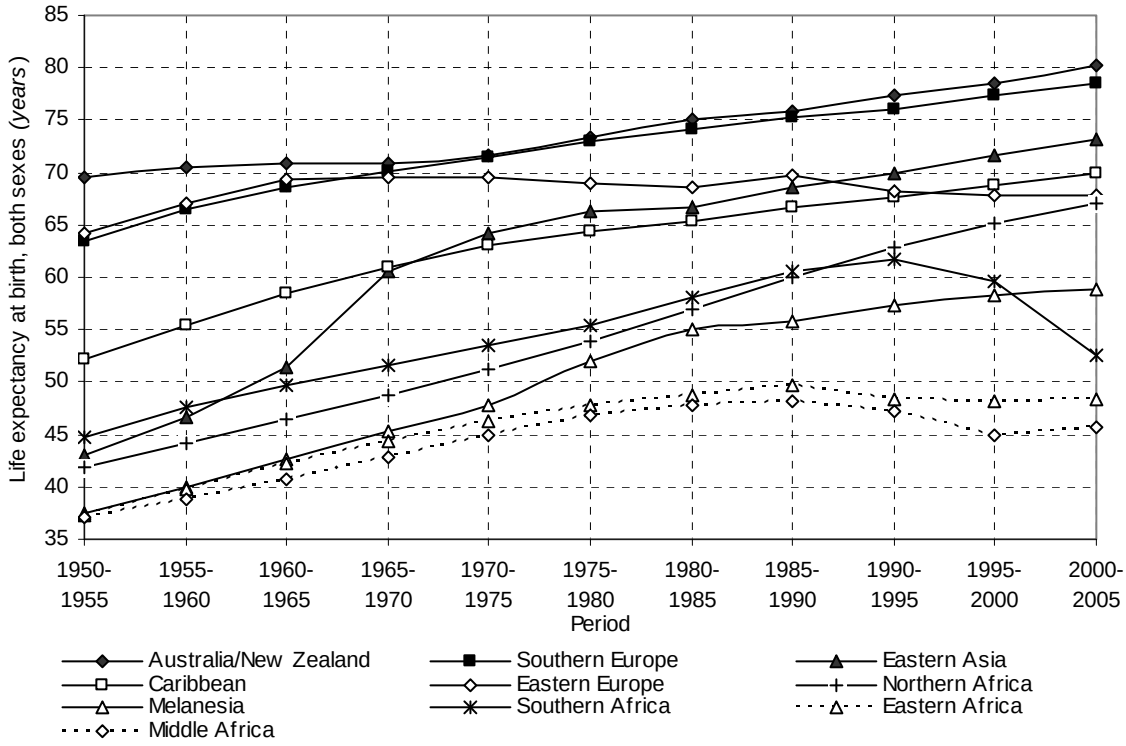


Figure IV.7. Life expectancy in regions, 1950-2005: less smooth trends



The Caribbean was slightly ahead of South America and Central America around 1950 but now has fallen slightly behind. Life expectancy in Eastern Asia in 1950-1955 was only 42.9 years, almost a decade shorter than in the Caribbean. After a remarkable rise in the 1960s, Eastern Asia has continued to gain and life expectancy is now three years longer. Melanesia had life expectancy about 15 years shorter than in Micronesia and Polynesia in 1950-1955. Despite constant improvement, especially in the middle and late 1970s, the gap has barely closed.

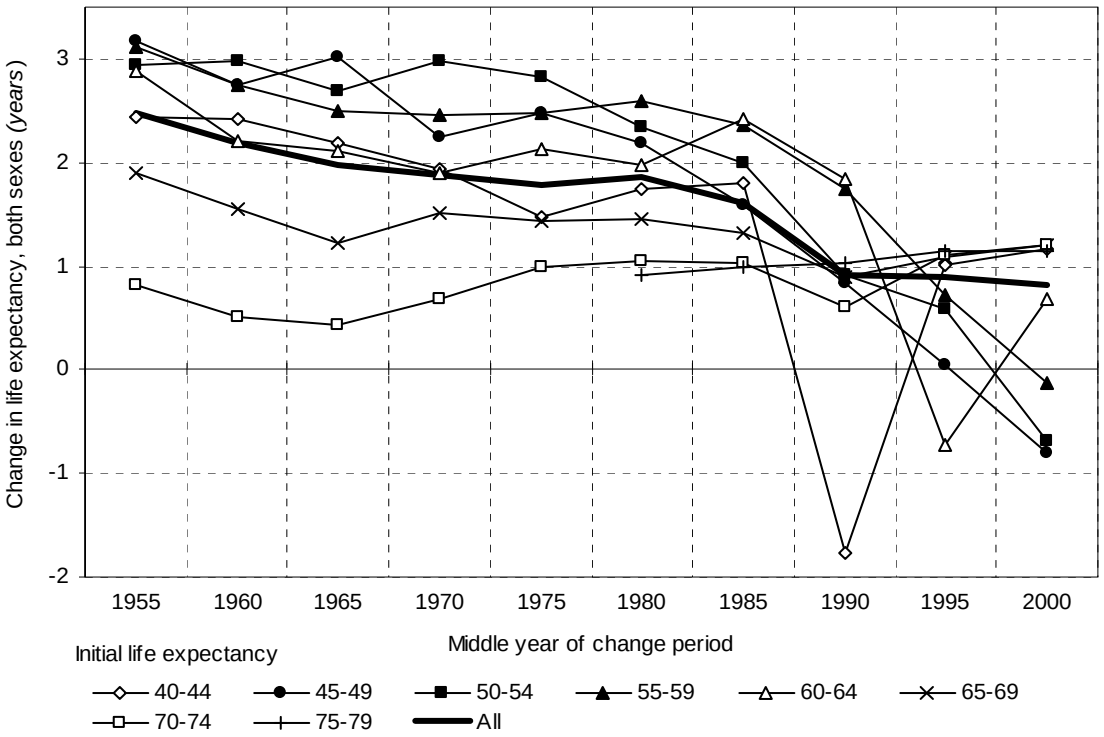
Four African regions, finally, have shown unusual patterns. Northern Africa showed a steady rise in life expectancy, accelerating slightly after 1980, so that it has reached the highest level on the continent. Southern Africa started in midcentury higher than Northern Africa, but after smaller increases and a sharp downturn around 1990, now has life expectancy 15 years shorter. Trends in Eastern and Middle Africa paralleled the smooth trends in Western Africa, but downturn set in by the 1990s, sharper in Middle than in Eastern Africa.

2. Levels and gains

From the regional variation, it is unclear whether life expectancy rises more slowly at high rather than low levels. Gains appear to slow over time in several regions but not consistently and the trends may have to do with particular historical factors.

Trends for 1950-1985 support the view that life expectancy rises more slowly at higher levels. But trends from 1985 onward, where one would expect the data to be more reliable and more relevant to future trends, do not support this view at least for the whole world (figure IV.8). For periods prior to 1985, a curvilinear relationship appears, with the greatest gains made from an initial level of life expectancy of around 50 years. When life expectancy reaches 70 years, gains on average are only half as much or less. Since 1985, however, gains have become less predictable and quite erratic and for the last period (from 1995-2000 to 2000-2005), the relationship is almost entirely reversed, with greater gains above 65 years. Partly because the data before 1985 cover a

Figure IV.8. Mean quinquennial change in life expectancy for countries grouped by initial life expectancy, by period



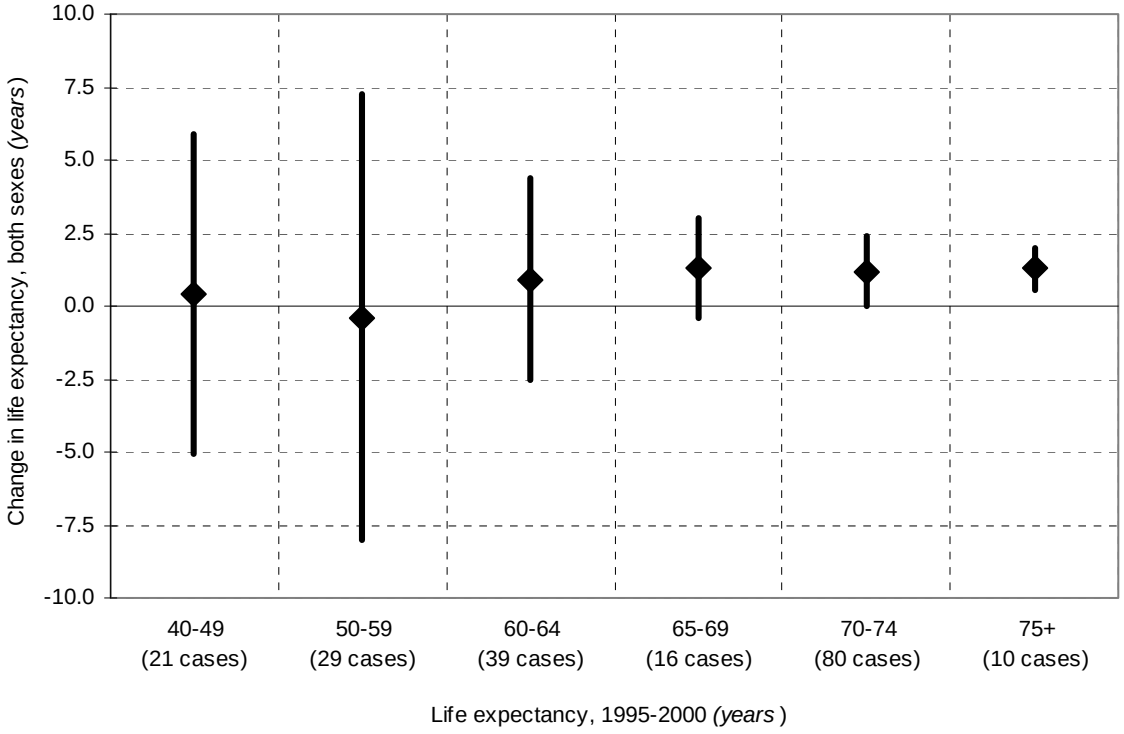
longer period, pooling the data across periods favours the view that gains decline at higher levels – but unless mortality crises occur, positive gains remain possible.

Figure IV.8 further shows that worldwide since 1950, but especially since 1980, gains in life expectancy have been declining at life expectancy levels below 70 years. Below 65 years, the decline over time has been fairly sharp, at 65-69 years it has been moderate and above 70 years, gains have actually increased slightly. For instance, where life expectancy was 55-59 years, the average quinquennial gain was 2.5 years between 1960 and 1980 but fell to 0.7 years around 1995 and was negative, though only slightly, around 2000.

Why it has become more difficult to raise life expectancy, particularly below 70 years, requires further investigation. Does this have to do with the particular countries that are still below this level, or are specific historical factors involved? The possibility that civil disturbances, poor public policy, or major new threats to survival, such as the HIV/AIDS epidemic, are involved is suggested by the fact that the variability of gains has changed. As seen in figures IV.6 and IV.7, progress in life expectancy has been uneven between regions of the world and worldwide trends hide substantial heterogeneity. Until around 1985, quinquennial changes in life expectancy at each life expectancy level had a standard deviation[1] across countries of around 1.0 years, meaning that the actual gains or losses for 95 per cent of countries at each life expectancy level were within 1.96 years of the estimated gains in figure IV.8 (assuming that the change in life expectancy follows a normal distribution). From around 1985, however, the standard deviation rose rapidly, doubling, tripling, or quadrupling for countries with lower Life expectancies. This is illustrated in figure IV.9, where the vertical bars

[1] The standard deviation measures the dispersion around the mean and is computed as the square root of the variance. The variance is calculated as the mean of the squared differences between the data values and the overall average value. For example, if life expectancies in all countries were identical, each deviation from the world average (mean) would be zero and the standard deviation would thus be equal to zero, its minimum value. If on the other hand life expectancies vary widely between countries and are dispersed further away from the mean, the standard deviation becomes larger and larger.

Figure IV.9. Average change in life expectancy from 1995-2000 to 2000-2005 and 95 per cent interval, for countries grouped by initial life expectancy



show the 95 per cent interval for change in life expectancy in the latest quinquennium. When life expectancy is 40-49 years, gains have a standard deviation of 2.8; when life expectancy is 75 years or higher, the standard deviation is only 0.4.

Variability in gains in particular regions may be part of the explanation (figure IV.10). With regions arrayed from low to high life expectancies, variability of gains appears to decline. Variable gains are much more likely in sub-Saharan Africa than in Europe. But not all the regions strictly follow this trend.

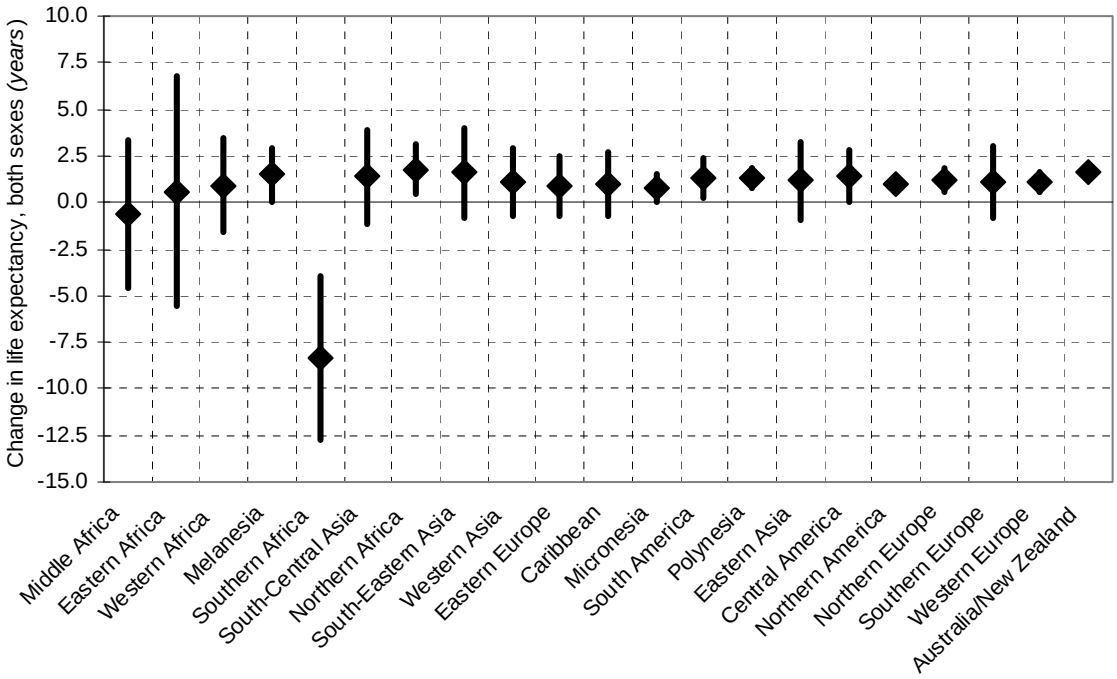
3. Future trends

Future trends in life expectancy are projected to avoid wild swings, not because these are believed to be unlikely but because they are unpredictable. Future life expectancies therefore show steady increases. In only a few cases is there decline—always for only one period, mainly in the first projection period, as a continuation of and recovery from, current negative trends. By region (table IV.1), only Southern Africa is expected to experience a fall in life expectancy (due to declines in Lesotho, South Africa and Swaziland) and then only for one period. Most quinquennial changes will involve increases of 0.5 to 2.0 years in life expectancy and the ranking of regions will be little changed from 2000-2005.

Overall, from 2000-2005 to 2045-2050, life expectancy is expected to rise from 52.7 to 67.2 years in the least developed countries, from 66.6 to 75.4 years in other less developed countries and from 75.6 to 82.4 years in more developed regions. Roughly speaking, by 2045-2050, least developed countries should reach the current level for other less developed countries and less developed regions (excluding the least developed countries) should reach the current level for more developed regions, so one development group is effectively half a century behind the next higher one (see figure IV.5).

For individual countries, gains are projected to be somewhat variable but to follow the pattern of the last half century (rather than the slower gain pattern of the last two decades) (details not shown). The projections assume that the limited life

Figure IV.10. Mean change in life expectancy from 1995-2000 to 2000-2005 and 95 per cent interval, by region (ordered by initial life expectancy)



expectancy gains since 1985 are something of an aberration and higher, more "normal" patterns of mortality reduction will be restored.

Given the relatively smooth progression of life expectancies, little change is expected in country rankings. The top four countries in 2045-2050 should be the same as in 2000-2005—Japan, followed by Hong Kong SAR, China, Iceland and Switzerland —each with a life expectancy of 86-87 years. At the bottom of the list, Zambia will not be the worst but will still be in the bottom five at 57 years. Zimbabwe should improve its relative position slightly more, rising from second worst to 20th worst. The lowest life expectancy for 2045-2050 is projected for Swaziland, at 53.9 years, a gain of 10 years of life in almost half a century.

4. The female advantage

As life expectancy rises worldwide, the rift between female and male life expectancies will change, the smaller gap in least developed countries and other less developed countries increasing while the larger gap in more developed regions decreases (table IV.3). The female advantage was smallest, in 2000-2005, in the least developed countries, at 2.4 years and greatest in more developed regions, at 7.4 years. By 2045-2050, the female advantage will rise to 3.7 years in the least developed countries and fall to 6.0 years in more developed regions. An unusually small female advantage and an unusually large one suggest that mortality is atypically high for one sex. The female advantage is less than two years in Western Africa and more than 11 years in Eastern Europe. The advantage is projected to grow or shrink toward more typical levels, but both regions will still be the extremes by 2045-2050.

The six countries where the female advantage is largest in 2000-2005 are all European countries that were part of the former Soviet Union. In each of them, females live at least 11 years longer than males. Also at that level is Kazakhstan, with Thailand close behind with a female advantage of 10.3 years. By 2045-2050, the female advantage will still be over seven years in all of these

TABLE IV.3. MALE AND FEMALE LIFE EXPECTANCIES FOR DEVELOPMENT GROUPS, MAJOR WORLD AREAS AND COUNTRIES WITH THE LARGEST AND SMALLEST FEMALE ADVANTAGE IN LIFE EXPECTANCY IN 2000-2005, SELECTED PERIODS *(years)*

Development group or major world area and country	*Male*				*Female*				*Female advantage*			
	1980-1985	*2000-2005*	*2020-2025*	*2045-2050*	*1980-1985*	*2000-2005*	*2020-2025*	*2045-2050*	*1980-1985*	*2000-2005*	*2020-2025*	*2045-2050*
World	**59.7**	**63.9**	**68.6**	**73.1**	**63.5**	**68.3**	**73.2**	**77.8**	**3.9**	**4.4**	**4.6**	**4.7**
More developed regions	69.1	71.9	75.7	79.4	76.4	79.3	82.4	85.4	7.3	7.4	6.7	6.0
Less developed regions	57.6	62.5	67.4	72.1	60.1	65.9	71.4	76.5	2.5	3.4	3.9	4.4
Least developed countries	47.3	51.5	58.4	65.4	49.3	54.0	61.3	69.1	2.0	2.4	2.9	3.7
Other less developed countries	59.4	64.9	69.8	74.2	62.1	68.5	73.9	78.7	2.7	3.6	4.1	4.4
Africa	**48.8**	**50.3**	**56.8**	**64.4**	**51.9**	**52.8**	**59.4**	**67.8**	**3.1**	**2.5**	**2.5**	**3.4**
Niger	44.1	55.4	63.0	69.1	41.4	53.6	62.1	70.4	-2.8	-1.8	-0.9	1.3
Zimbabwe	58.7	40.2	53.0	62.8	62.3	39.7	52.8	65.7	3.6	-0.5	-0.2	2.8
Zambia	50.2	38.9	48.1	55.9	53.6	39.4	48.4	59.0	3.4	0.5	0.3	3.1
Ghana	52.4	58.0	64.1	69.7	55.3	58.9	65.9	72.2	2.9	0.9	1.8	2.6
Uganda	48.4	47.3	57.1	64.0	51.5	48.2	59.3	66.5	3.1	0.9	2.2	2.5
Cameroon	51.5	49.3	54.7	63.2	54.6	50.3	56.5	65.7	3.1	1.0	1.7	2.5
Mauritius	64.0	68.6	72.0	75.9	69.5	75.5	78.2	81.6	5.5	6.9	6.2	5.7
Réunion	65.4	71.5	74.3	77.0	74.5	80.0	81.9	83.9	9.2	8.4	7.6	6.9
Asia	**59.6**	**65.8**	**71.0**	**75.2**	**61.8**	**69.4**	**75.2**	**79.7**	**2.1**	**3.5**	**4.3**	**4.5**
Afghanistan	40.0	42.2	48.9	58.5	39.7	42.1	49.0	58.9	-0.3	-0.1	0.1	0.5
Maldives	58.4	65.6	71.9	75.9	55.8	65.6	75.0	79.6	-2.7	0.0	3.2	3.8
Pakistan	56.4	63.3	69.7	74.4	56.0	63.9	70.5	77.0	-0.4	0.6	0.8	2.6
Nepal	49.9	61.0	68.3	73.6	49.3	61.6	70.8	77.3	-0.5	0.7	2.5	3.7
Thailand	61.7	63.7	70.3	74.9	68.0	74.0	77.4	81.1	6.3	10.3	7.1	6.3
Kazakhstan	60.4	59.5	67.4	73.0	70.9	70.6	76.3	80.4	10.5	11.1	9.0	7.4
Europe	**67.7**	**69.6**	**73.7**	**77.8**	**75.5**	**78.0**	**81.0**	**84.2**	**7.8**	**8.4**	**7.4**	**6.4**
Iceland	73.9	79.3	81.9	84.5	79.8	82.7	85.0	87.7	5.9	3.5	3.2	3.3
Greece	72.8	76.4	79.0	81.8	77.5	80.1	83.8	86.6	4.7	3.8	4.8	4.8
Latvia	64.5	65.7	71.1	75.7	74.2	76.8	80.0	83.4	9.7	11.1	8.9	7.7
Lithuania	66.1	66.4	71.2	75.8	75.7	77.7	80.5	83.4	9.6	11.3	9.3	7.6
Ukraine	64.4	62.0	65.9	71.0	73.8	73.4	75.9	79.1	9.4	11.5	10.0	8.1
Estonia	64.4	65.1	70.1	75.4	74.3	76.7	79.3	82.4	9.9	11.5	9.2	6.9
Belarus	65.6	62.5	66.1	71.2	75.2	74.6	77.0	80.0	9.6	12.1	10.9	8.8
Russian Federation	61.4	58.5	62.6	68.5	72.7	71.8	74.6	77.9	11.3	13.3	12.0	9.3

TABLE IV.3 (CONTINUED)

Development group or major world area and country	Male				Female				Female advantage			
	1980-1985	*2000-2005*	*2020-2025*	*2045-2050*	*1980-1985*	*2000-2005*	*2020-2025*	*2045-2050*	*1980-1985*	*2000-2005*	*2020-2025*	*2045-2050*
Latin America and the Caribbean	**62.0**	**68.8**	**73.2**	**76.5**	**68.2**	**75.3**	**79.5**	**82.7**	**6.2**	**6.6**	**6.2**	**6.2**
Grenada	63.4	66.1	69.3	74.0	67.4	69.3	73.1	78.3	4.0	3.2	3.8	4.3
Haiti	50.2	56.4	63.9	71.8	52.9	59.9	68.1	76.6	2.7	3.4	4.2	4.8
United States Virgin Islands	68.9	74.6	77.6	80.5	75.6	82.6	85.1	87.8	6.7	8.0	7.5	7.3
Puerto Rico	70.5	73.7	76.7	79.5	77.5	82.0	84.3	86.6	7.0	8.3	7.5	7.1
Northern America	**70.8**	**74.9**	**77.7**	**80.7**	**77.8**	**80.3**	**82.9**	**85.9**	**7.0**	**5.3**	**5.2**	**5.2**
Canada	72.5	77.3	80.5	83.2	79.5	82.3	84.7	87.5	7.0	4.9	4.3	4.3
United States of America	70.8	74.7	77.4	80.4	77.9	80.0	82.7	85.7	7.2	5.4	5.3	5.3
Oceania	**66.8**	**71.6**	**75.4**	**79.0**	**73.7**	**77.3**	**80.0**	**83.1**	**6.9**	**5.7**	**4.6**	**4.0**
Micronesia (Fed. States of)	64.8	66.9	69.9	74.4	65.9	68.2	72.2	77.8	1.1	1.3	2.4	3.4
Solomon Islands	58.2	61.6	65.7	70.8	59.5	63.0	68.4	74.3	1.3	1.4	2.7	3.5
Samoa	58.0	67.1	72.0	75.8	64.6	73.5	77.9	81.4	6.6	6.4	6.0	5.6
New Caledonia	65.6	71.9	75.4	78.8	71.6	78.7	81.9	85.0	6.0	6.8	6.5	6.2

countries except Estonia and Thailand. In a few other countries, the female advantage will also be of that size by then, notably in Japan, where female life expectancy is projected to rise quickly.

The large female advantage in the European countries of the former Soviet Union is mainly due to high male mortality. When male and female life expectancies in these countries are compared with European averages (as with the three countries in figure IV.11), the deficits are always greater, sometimes substantially so, among males than females.

Of countries where the female advantage is smallest, nine actually have or will have higher male than female life expectancies, either in 2000-2005 or at some point before 2050. There are two patterns among these countries (figure IV.12). Niger and Afghanistan have very high fertility and high maternal mortality, so female life expectancy is short but is projected to rise gradually. The Southern African countries, in contrast, are threatened by HIV/AIDS, which is projected to reduce female life expectancy for perhaps a decade, or at least to slow its rise relative to male life expectancy. Besides Swaziland, Lesotho and South Africa, shown in the figure, Botswana and Namibia will also be affected, as well as the neighbouring country of Mozambique. Zimbabwe may also partly share in this pattern.

B. MORTALITY AND SURVIVAL AT DIFFERENT AGES

Falling life expectancies reflect falling mortality in particular age groups—which age groups may vary with circumstances. Mortality at the youngest ages receives the most attention because it is high in poorer countries but reducible with appropriate effort and more readily measured than mortality at other ages.

Figure IV.11. Male and female life expectancies and deficits relative to European averages: three countries over three periods

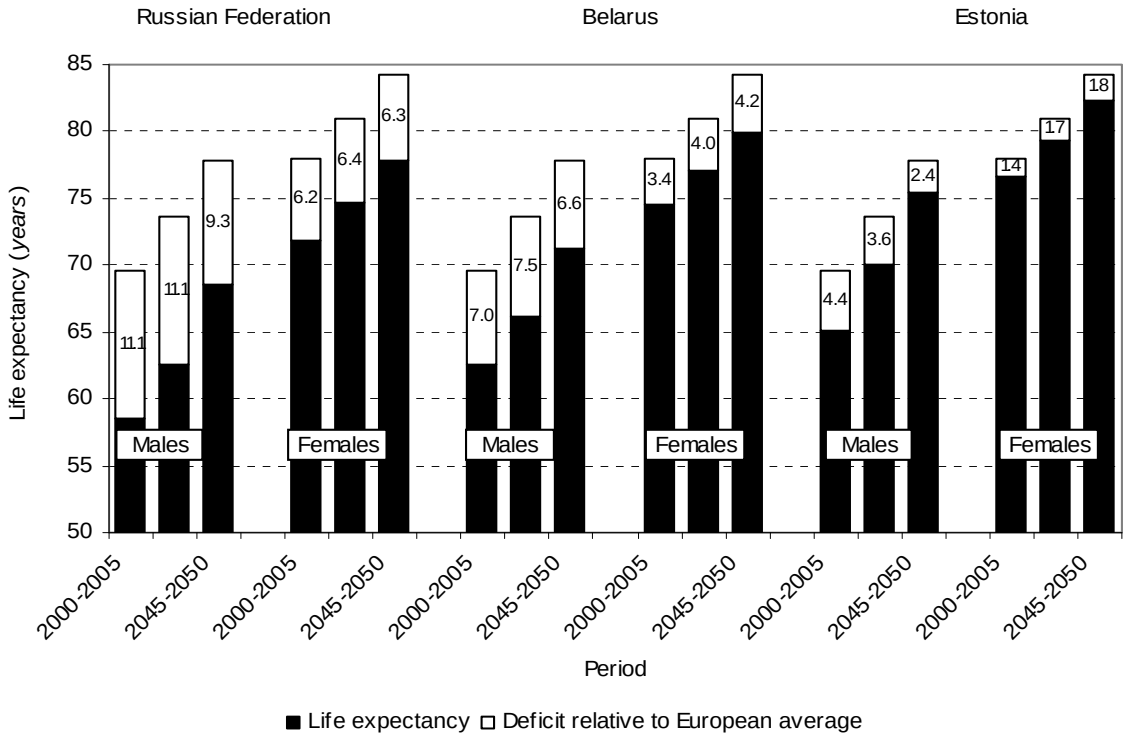
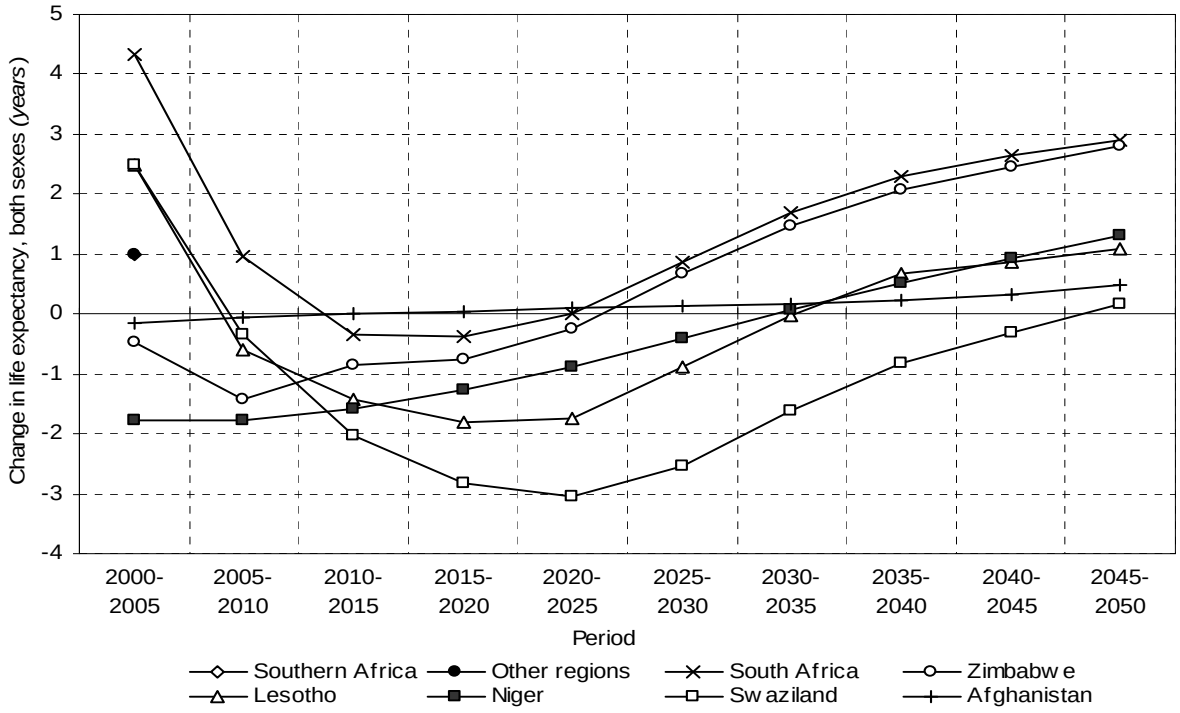


Figure IV.12. Selected countries where male life expectancy exceeds or will exceed female life expectancy, 2005-2050



1. Infant and child mortality

Figure IV.13 shows how infant mortality varies across regions. It was very high in 2000-2005 in the three tropical regions of sub-Saharan Africa, between 89 and 117 deaths per thousand births. For less developed regions excluding the least developed countries (i.e., other less developed countries) as a whole, the rate was only 49 per thousand. Among more developed regions, infant mortality was highest in Eastern Europe, at 14 deaths per thousand births. The other regions all had rates of 4-7 per thousand.

The contrast between less developed and more developed regions looks even starker if one focuses on the highest and lowest levels per country. In 2000-2005, the lowest infant mortality rates were in Singapore, Iceland, Japan and Sweden, where there were only three deaths per thousand births. Several other countries were not far behind. The highest infant mortality rate was in Afghanistan, at 168 deaths per thousand births. Afghanistan stands out, among the countries with high rates, because almost all the others with rates of at least 80 are in sub-Saharan Africa. The only others besides Afghanistan outside these regions are Iraq and Swaziland. In the three tropical regions of sub-Saharan Africa, 26 out of 41 countries have infant mortality rates above 80 per thousand.

The risk of death is much higher in infancy than later in childhood. In more developed regions as a whole in 2000-2005, eight deaths could be expected before the age of one year in a birth cohort of 1 000. Between ages one and five, only two additional deaths could be expected in that cohort. In less developed regions, child deaths are much more common, though still fewer than infant deaths. Out of a birth cohort of 1 000 in the least developed countries, 95 could be expected to die before age one and an additional 58 between ages one and five. In other less developed countries, 49 could be expected to die before age one and an additional 21 between ages one and five. The higher infant mortality is, the higher the proportion dying between ages one and five (the correlation is 0.95 across countries in 2000-2005), though the latter never exceed\s the former. The under-five mortality rate, which combines risks over these two periods of life, is an important indicator for development (table IV.4).

Figure IV.13. Infant mortality rate by region, 2000-2005

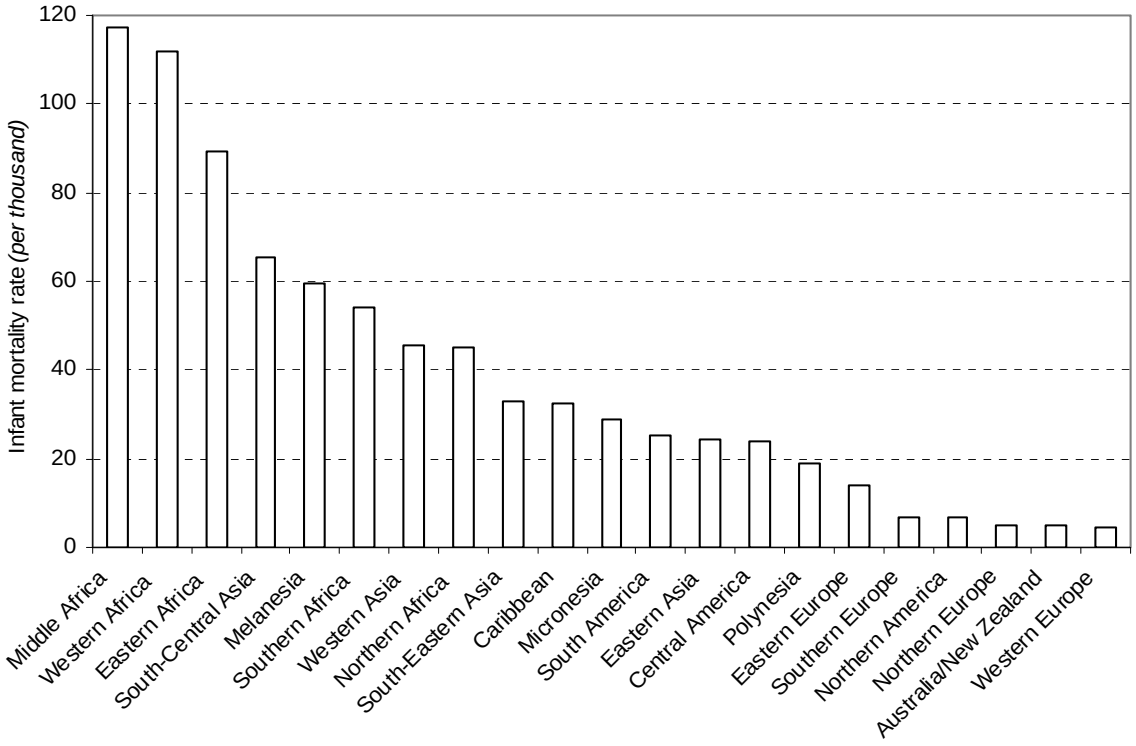


TABLE IV.4. INFANT AND UNDER-FIVE MORTALITY FOR THE WORLD, DEVELOPMENT GROUPS AND MAJOR WORLD AREAS, 1995-2000 AND 2000-2005
(deaths per 1 000 live births under ages 1 and 5)

	1995-2000		*2000-2005*	
Development group or major world area	*Infant mortality*	*Under-five mortality*	*Infant mortality*	*Under-five mortality*
World	58	86	54	80
More developed regions	9	11	8	9
Less developed regions	63	94	59	88
Least developed countries	103	167	95	153
Other less developed countries	53	75	49	69
Africa	99	164	93	154
Asia	54	74	49	67
Europe	11	13	9	11
Latin America and the Caribbean	32	40	25	32
Northern America	7	9	7	8
Oceania	30	41	29	39

NOTE: The difference between under-five mortality and infant mortality in 2000-2005 in more developed regions, before rounding, is 1.8 and in other less developed countries 20.6, which is why figures of 2 and 21 are cited in the text.

2. Adult mortality

To take a closer look at mortality beyond infancy, it is useful to divide the life span into segments and estimate the likelihood of surviving from one age to the next (table IV.5). Figure IV.14 shows the probability of surviving five years beyond age 0 ($_5p_0$), ten years beyond age 5 ($_{10}p_5$), 45 years beyond age 15 ($_{45}p_{15}$) and 20 years beyond age 60 ($_{20}p_{60}$), effectively dividing the age range from 0 to 80 years into four segments. Globally in 2000-2005, the probability of surviving from age 0 to age 5 was 92 per cent; from age 5 to age 15, 98 per cent; from age 15 to age 60, 81 per cent and from age 60 to age 80, 48 per cent. (The product of these probabilities is 35 per cent, the probability of surviving from birth to age 80).

Among development groups, there were differences in the probability of survival at each age. In the least developed countries, the probability of surviving to age 5 was 85 per cent, versus 99 per cent in more developed regions. The probability of surviving from age 5 to age 15 was generally higher and varied much less, from 96 per cent in the least developed countries to virtually 100 per cent in more developed regions.

TABLE IV.5. PROBABILITY OF SURVIVING AT DIFFERENT AGES (BOTH SEXES) FOR THE WORLD, DEVELOPMENT GROUPS, MAJOR WORLD AREAS AND REGIONS, 2000-2005

Development group or major world area and region	*Age 0 to 5 (5p10)*	*Age 5 to 15 (10p5)*	*Age 15 to 60 (45p15)*
World	**0.920**	**0.984**	**0.812**
More developed regions	0.991	0.998	0.863
Less developed regions	0.912	0.983	0.797
Least developed countries	0.847	0.963	0.658
Other less developed countries	0.931	0.987	0.816
Africa	**0.846**	**0.961**	**0.630**
Eastern Africa	0.852	0.957	0.531
Middle Africa	0.798	0.942	0.569
Northern Africa	0.939	0.988	0.835
Southern Africa	0.920	0.989	0.497
Western Africa	0.813	0.952	0.644
Asia	**0.933**	**0.988**	**0.830**
Eastern Asia	0.970	0.994	0.874
South-Central Asia	0.907	0.984	0.777
South-Eastern Asia	0.957	0.991	0.818
Western Asia	0.942	0.992	0.847
Europe	**0.989**	**0.997**	**0.838**
Eastern Europe	0.982	0.996	0.751
Northern Europe	0.994	0.999	0.912
Southern Europe	0.992	0.998	0.919
Western Europe	0.994	0.999	0.919
Latin America and the Caribbean	**0.968**	**0.994**	**0.839**
Caribbean	0.957	0.987	0.829
Central America	0.970	0.995	0.867
South America	0.968	0.994	0.830
Northern America	**0.992**	**0.998**	**0.896**
Oceania	**0.961**	**0.993**	**0.884**
Australia/New Zealand	0.994	0.999	0.932
Melanesia	0.918	0.983	0.674
Micronesia	0.964	0.994	0.863
Polynesia	0.977	0.996	0.851

Adult survival, from age 15 to age 60, involves a much longer part of life and was considerably lower, varying from 66 per cent in the least developed countries to 86 per cent in more developed regions. At older ages, survival from age 60 to age 80 varied even more, from 32 per cent in the least developed countries to 55 per cent in more developed regions.

Focusing only on the two older age groups, figure IV.15 shows variation across regions in 2000-2005. The lowest levels of adult survival ($_{45}p_{15}$) in sub-Saharan Africa are in Southern Africa, where however survival at older ages ($_{20}p_{60}$) is higher than in the rest of sub-Saharan Africa. Eastern Europe, for a more developed region, has an unusually low level of adult survival, lower than in any region in Asia or in Latin America and the Caribbean. Survival at older ages does not always match adult survival. In the three Latin America and Caribbean regions, in particular, survival at older ages is well above the level in Eastern Europe and close to levels in other more developed regions.

Survival at older ages tends to be at 20-40 per cent across countries until adult survival approaches 90 per cent. At this point, survival at older ages tends to climb steeply. Once adult survival reaches 95 per cent, older survival is almost always above 50 per cent and has almost reached 70 per cent in Japan. Falling mortality at older ages is an important element in population aging.

Some countries are worth noting for rather exceptional patterns. In Mauritania, adult survival reached 84 per cent in 2000-2005, a typical level for Northern Africa, but survival at older ages was only 25 per cent, below typical levels for sub-Saharan Africa. Almost as wide a gap between adult survival and survival at older ages was evident in other Sahelian countries. In contrast, Zimbabwe had a unique status in 2000-2005 as the only country where adult survival, at 23 per cent, was not only considerably lower than anywhere else but also lower than survival at older ages (26 per cent).

Discrepancies such as these are projected to be erased over time as mortality declines overall (figure IV.16). Within five years, the gap between adult survival and survival at older ages in Zimbabwe is expected to be reversed, though even in the long run the projection is that adult survival will not be that much better. In Mauritania, the gap is expected to narrow but still to remain much wider than in Zimbabwe. The situation is different for more developed regions. In Japan, for instance, where adult survival is already 94 per cent, further reductions in mortality will come increasingly at older ages. Survival at older ages, already 69 per cent, closer to adult survival than in any other more developed country, will come closer still in the future.

For five major world areas, adult survival is expected to be between 88 and 92 per cent by 2020-2025 and between 91 and 95 per cent by 2045-2050 (figure IV.17). In Africa, however, it will only reach 70 per cent by 2020-2025 and 78 per cent by 2045-2050. Survival at older ages will be somewhat more variable across major areas but will still exceed 60 per cent by 2045-2050 in each major area except Africa, where it will still be 47 per cent.

It was noted earlier that life expectancy in one development group will overtake life expectancy in the next higher development group by midcentury. The current pattern of survivorship by age in one development group will then become essentially the pattern in another group, as figure IV.18 shows.

Figure IV.14. Probability of surviving y years beyond age x ($_yp_x$), for the world, development groups and major world areas, 2000-2005

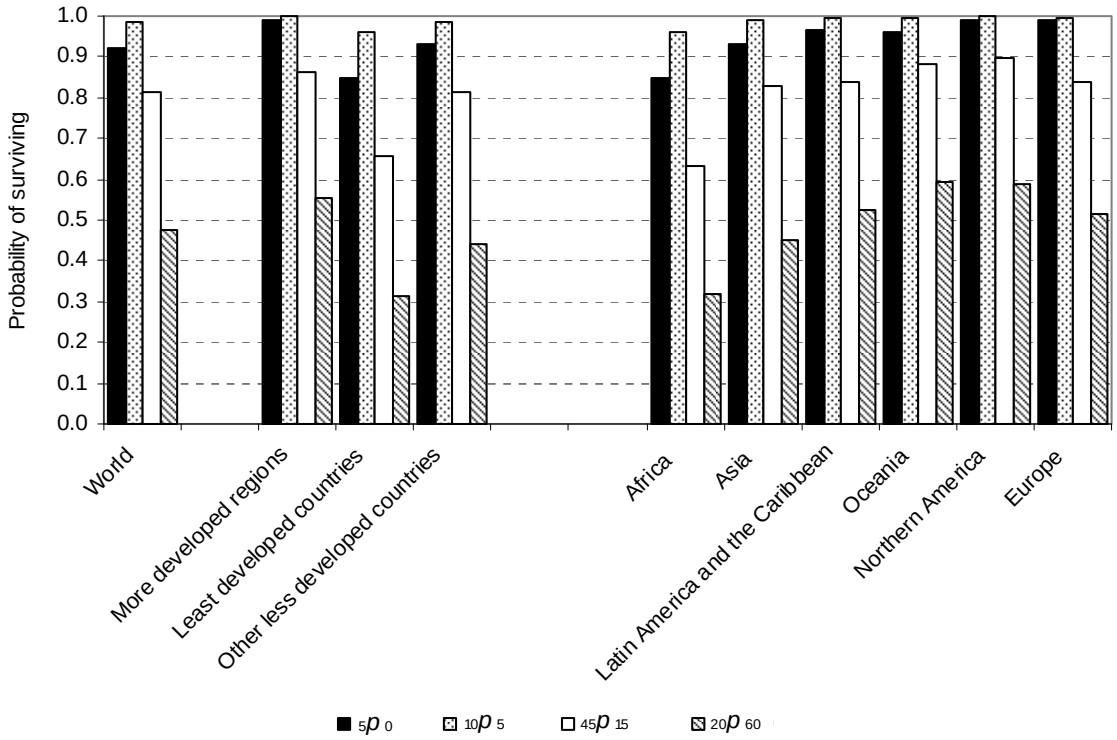


Figure IV.15. Probability of surviving from age 15 to age 60 and from age 60 to age 80, by region, 2000-2005

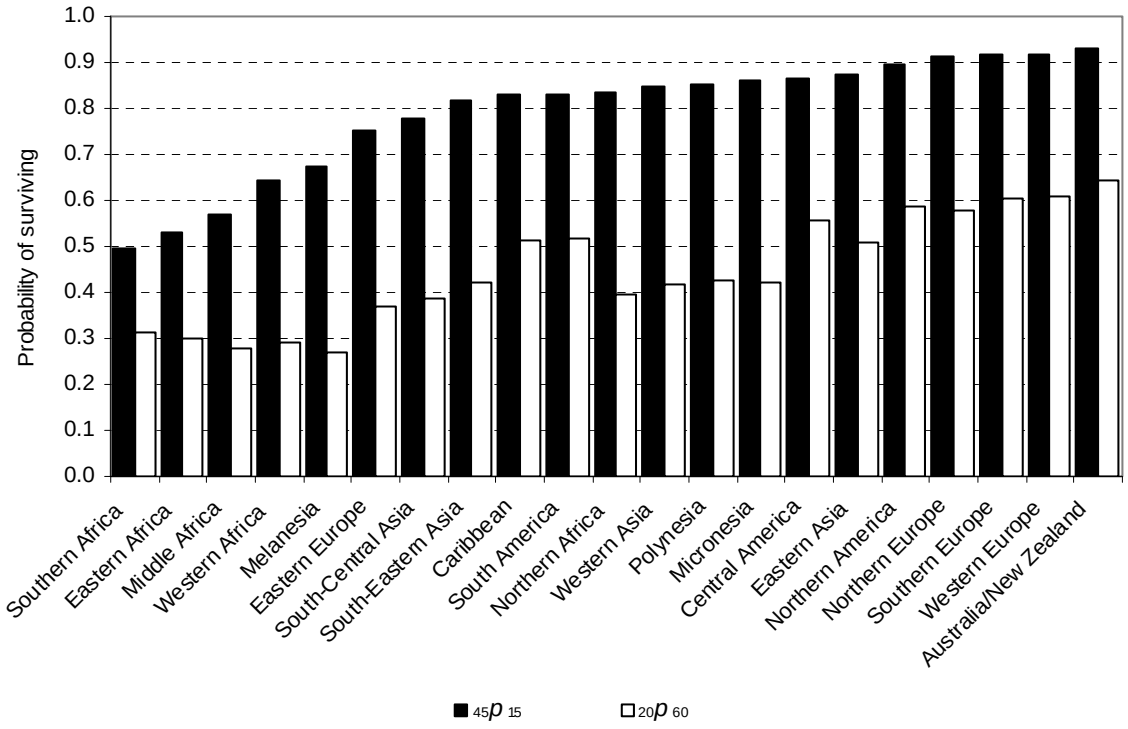


Figure IV.16. Probability of surviving from age 15 to age 60 and from age 60 to age 80, selected countries, 2000-2005 to 2045-2050

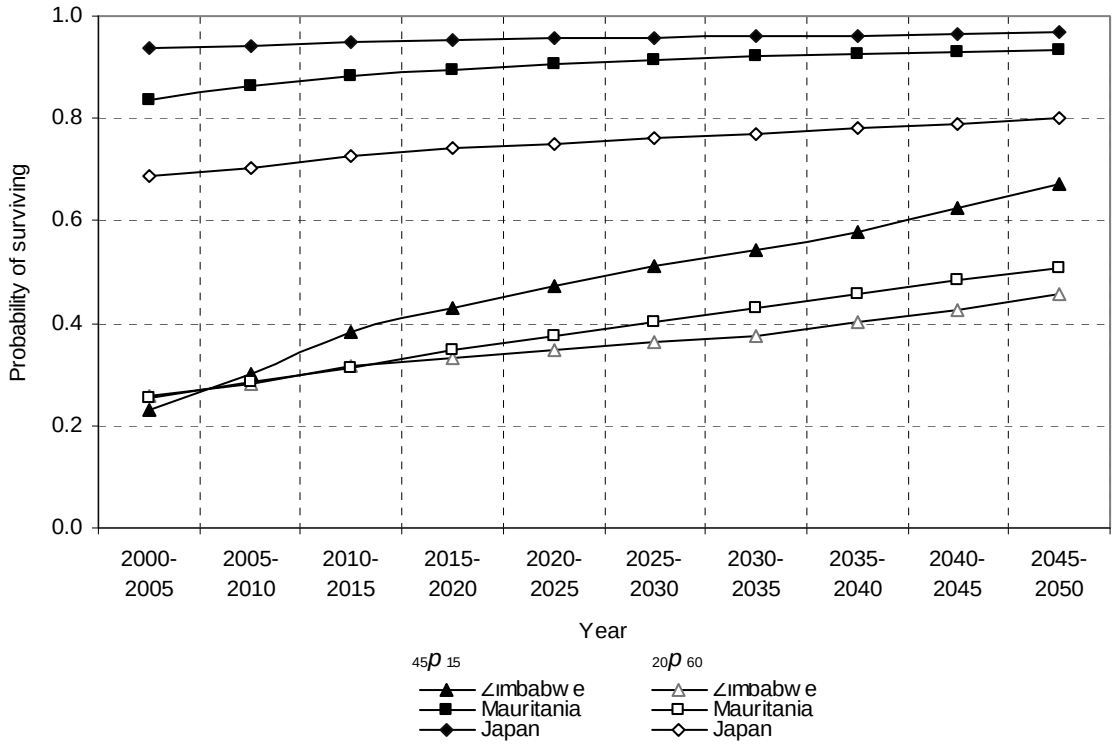
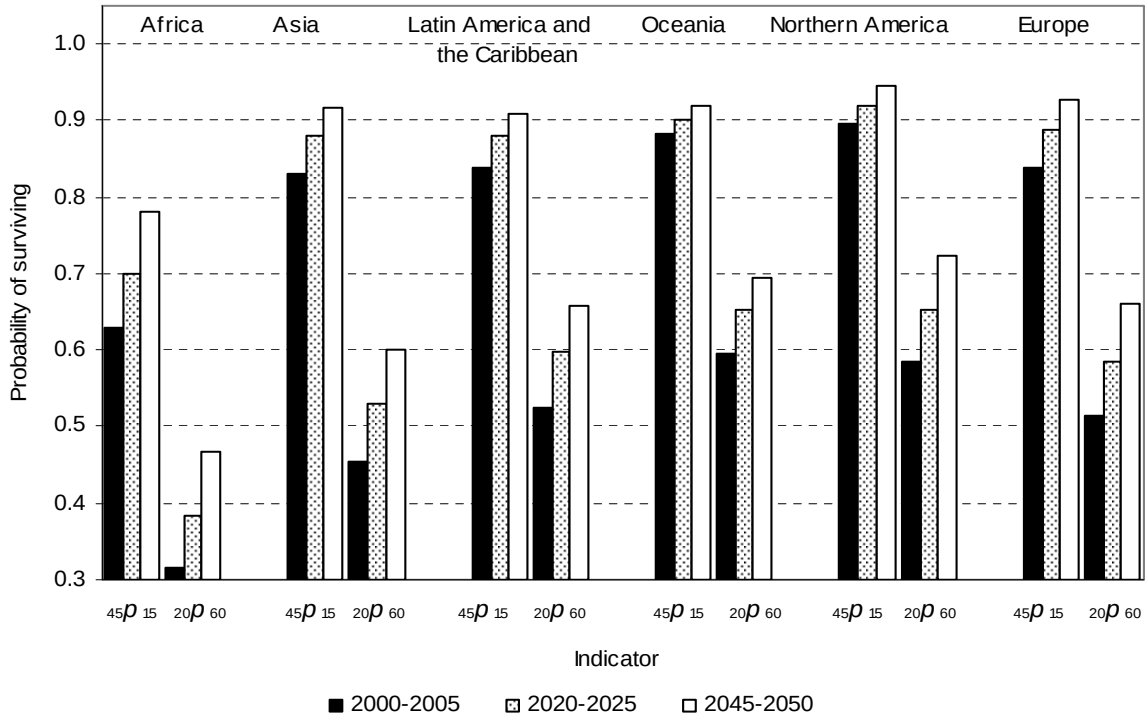


Figure IV.17. Probability of surviving from age 15 to age 60 and from age 60 to age 80, by major world area, 2000-2005, 2020-2025 and 2045-2050



C. AIDS AND MORTALITY

The rise in life expectancies over the last half century has been interrupted at points by catastrophe: famine and tsunamis, war and civil unrest, death on a large scale. Even among such tragic events, the HIV/AIDS epidemic is unusual, not just for the scale of deaths but for their wide distribution around the globe. Deaths from AIDS, unlike deaths from other catastrophes, also can, with appropriate models and some assumptions about human behaviour, be estimated and predicted. An effort is therefore made to specifically incorporate the effect of AIDS into the projections, running an epidemiological model from 1980 onwards for 62 countries with HIV prevalence above 1 per cent of adults aged 15-49 years or with significant numbers of HIV/AIDS related deaths due to large populations.[2] For other countries, the demographic effect is small and any impact is essentially incorporated into the past mortality trend used to guide projections.

Of the 62 countries for which an AIDS epidemic is modelled, 40 are in Africa, 11 in Latin America and the Caribbean, five in Asia, four in Europe and one each in Northern America and Oceania. Before looking at the effect of AIDS in particular cases, it is helpful to show how it affects mortality in general.

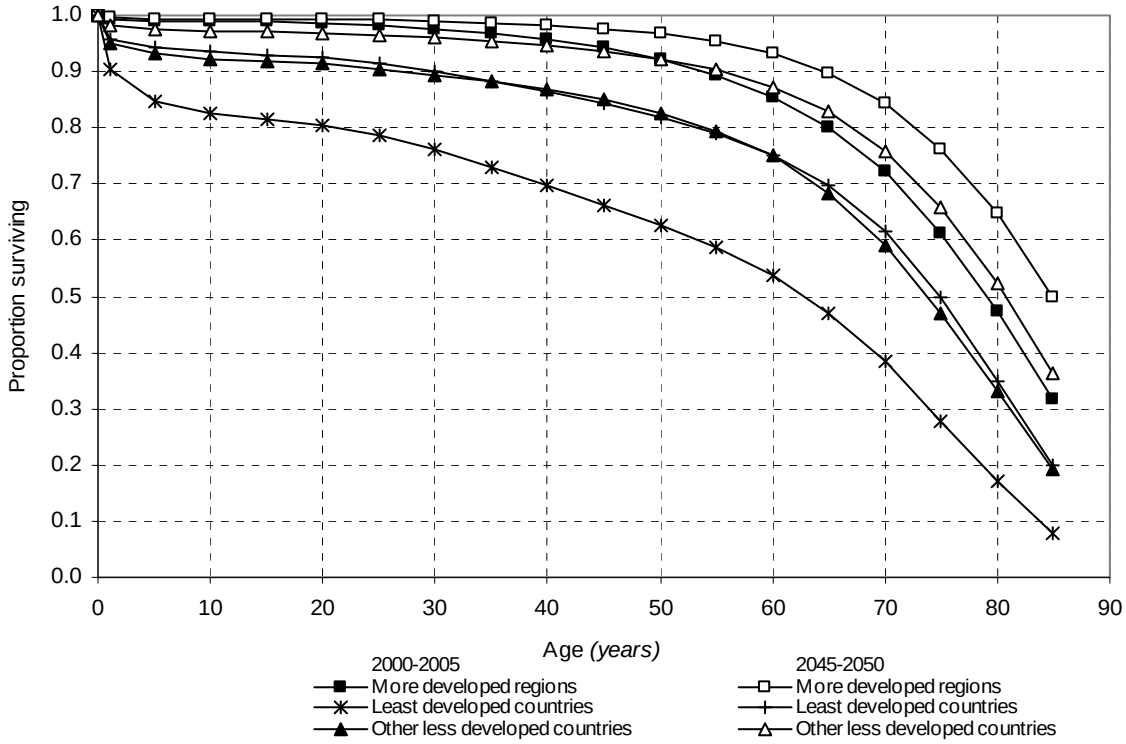
Generally, life expectancy is reduced and much more where HIV prevalence is higher. Given the start of the epidemic in the 1970s or 1980s, the peak impact is expected between 2000 and 2010 (figure IV.19). Where HIV prevalence is 20 per cent or higher, male life expectancy is reduced by 22 years in 2000-2005 from what it would have been at zero HIV prevalence, female life expectancy by 26 years. By 2020-2025, the reductions will be15 years and 21 years for the two sexes. Where HIV prevalence is between 5 and 10 per cent, the reductions in life expectancy in 2000-2005 are much smaller but still substantial: seven years for males and nine for females. By 2020-2025, the reductions will be two-thirds and three-fourths as large respectively. For countries where prevalence is under 1 per cent, the reduction is close to half a year. At these low levels, the epidemic is more likely to have impacted particular susceptible subpopulations rather than the broad heterosexual population and the impact on female life expectancy is less than on male life expectancy.

How specific countries are affected is shown in figure IV.20. For 2000-2005, nine countries had reductions in life expectancy of at least 10 years from the hypothetical levels without HIV/AIDS. All five countries in Southern Africa were affected to this degree, as well as three neighbouring countries (Zambia, Zimbabwe and Malawi) and only one other country in Middle Africa (the Central African Republic). The impact of AIDS has much to do with the distinctiveness of mortality patterns in Southern Africa, including declining life expectancy, high female mortality and high adult mortality (table IV.6).

Zimbabwe, the most affected country, is also the one country in the world where HIV prevalence fell by more than 1 percentage point from 2003 to 2005. It was 22.1 per cent among adults aged 15-49 in 2003 and 20.1 per cent in 2005, according to UNAIDS (June 2006). HIV prevalence did rise in Swaziland (from 33.5 to 34.2 per cent), but there were also notable declines in Southern and Eastern Africa over these two years: in Lesotho by 0.4 points, Kenya by 0.8

[2] Countries included with HIV prevalence below 1 per cent are, in order of declining prevalence: India, the United States, Madagascar, Brazil and China. All the HIV prevalence estimates were provided by UNAIDS in mid-2006. Subsequent changes in their estimates, particularly further reductions for some countries (UNAIDS 2007), could not be incorporated, so the current projections may still reflect slightly higher HIV prevalence than is warranted. Some reduction in the demographic impact of given HIV levels has been estimated based on better coverage with antiretroviral therapy of HIV patients and longer survival times (see the methodology chapter). Besides population projections incorporating and leaving out the effects of AIDS (to allow analysis of demographic effects), alternate projection scenarios were also run: (a) assuming current levels reached in 2005 remain constant in the future and (b) assuming the ideal case in which a perfectly effective vaccine against HIV would be instantly available to everyone by 2010 (i.e., no new HIV infection would occur from 2010 onward). Given the recent recognition that HIV prevalence had been overestimated and given also disappointing results with vaccine development, neither of these alternatives is considered here – but detailed data are available for these counterfactual scenarios on the CD-ROM Edition of the *World Population Prospects: The 2006 Revision*.

Figure IV.18. Proportion surviving to each age, by development group, 2000-2015 and 2045-2050



BOX IV.1. MEASURING THE PREVALENCE OF HIV

The burden of HIV in a population is measured by looking at the prevalence of HIV in the population, that is, the percentage infected with HIV. In theory prevalence can be calculated for any group with the relevant data or estimates, but in practice it is difficult to measure, even in countries with good health statistics. HIV infection produces no symptoms for many years and a large proportion of HIV-positive individuals do not know their HIV status. While more information exists about HIV/AIDS than about many other infectious diseases, the ranges around the estimates of HIV prevalence demonstrate the uncertainty that surrounds measurement of the epidemic (table IV.5).

In countries with generalized HIV/AIDS epidemics, where the primary mode of HIV transmission is heterosexual contact, national prevalence estimates are usually based on surveillance testing of pregnant women at selected antenatal clinics (UNAIDS/WHO, 2005). The reliability of these estimates depends on a number of factors, including whether HIV prevalence among pregnant women is representative of that among non-pregnant women and among men and whether the assumptions made about survival of infected individuals are correct. In addition, selected surveillance sites may not be representative with regard to the national population; for example, rural sites may be underrepresented in the sample. Also, the quality of national surveillance systems varies (Garcia-Calleja and others, 2004; Grassly and others, 2004). Recently, nationally representative household surveys have provided another source of data on HIV infection in some countries, but these surveys are also subject to potential biases. For example, people who are not tested due to absence from the household may be more likely to be HIV-positive (UNAIDS, 2004).

For countries with low-level or concentrated epidemics, prevalence must be estimated for high-risk groups such as intravenous-drug users, sex workers and their clients and men who have sex with men. Estimating both the size of these groups and the prevalence within them entails high levels of uncertainty (Walker and others, 2004).

Figure IV.19. Change due to AIDS in country life expectancy, by sex and country level of HIV prevalence, 1980-2050

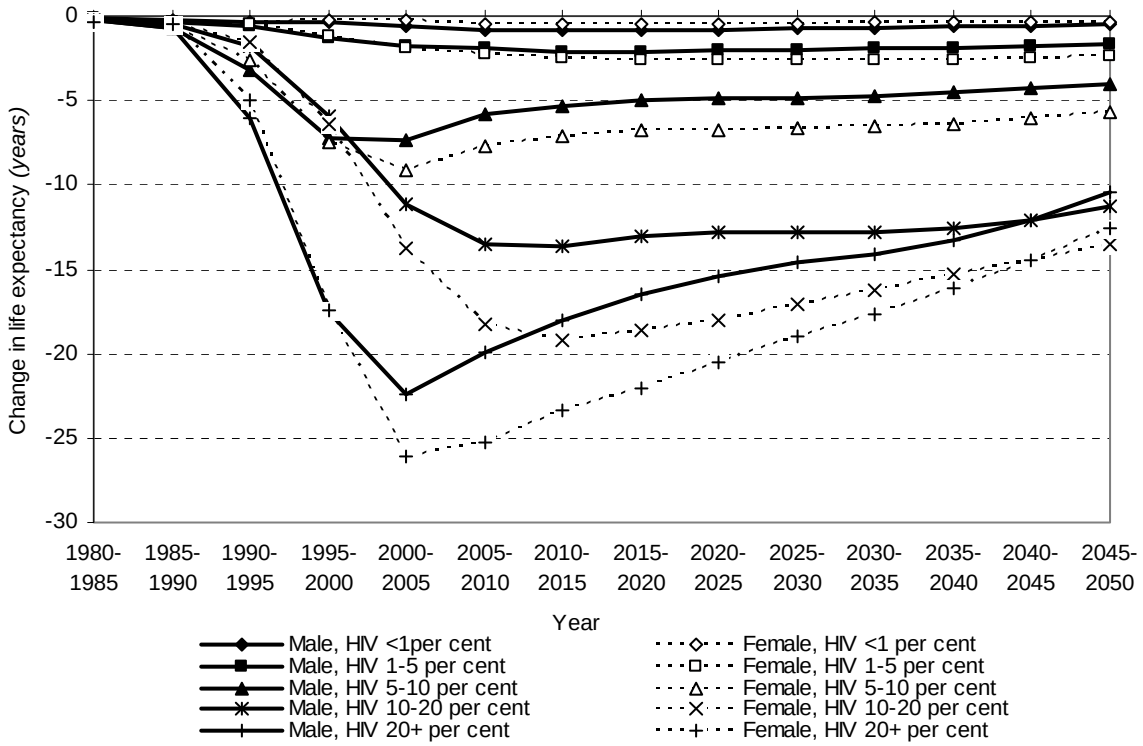


Figure IV.20. Actual life expectancy in 2000-2005 and theoretical life expectancy without AIDS, 62 countries

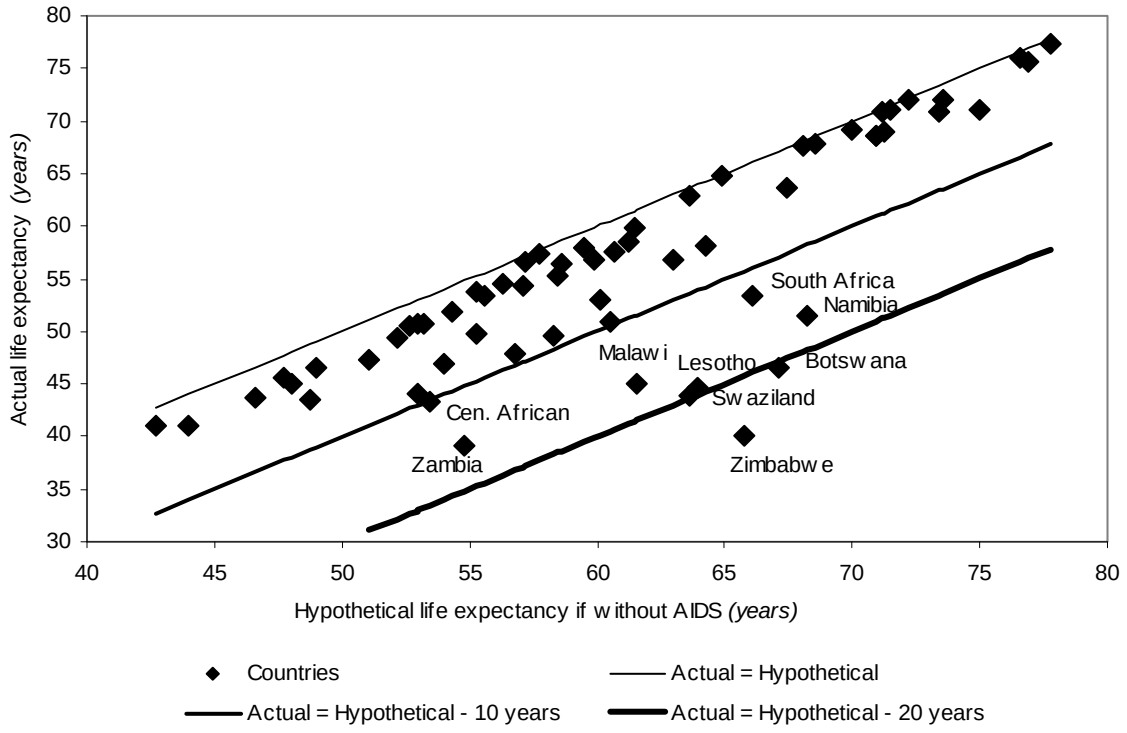


TABLE IV.6. MAXIMUM ESTIMATED OR PROJECTED REDUCTIONS IN LIFE EXPECTANCY AND POPULATION GROWTH DUE TO AIDS AND RESULTING RATES

Country	HIV prevalence 2005	Reduction in life expectancy (years) 1995-2000	2000-2005	2005-2010	2010-2015	Resulting life expectancy (years) 1995-2000	2000-2005	2005-2010	2010-2015
Swaziland	33.4	-7.6	-19.8	-25.9	**-27.0**	54.3	43.9	39.6	40.1
Zimbabwe	20.1	-20.1	**-25.8**	-22.9	-20.2	46.8	40.0	43.5	47.4
Lesotho	23.2	-7.4	-19.3	**-22.9**	-22.2	55.6	44.6	42.6	44.8
Botswana	24.1	-14.5	**-20.4**	-17.0	-16.8	52.6	46.6	50.7	52.0
South Africa	18.8	-4.6	-12.7	-18.2	**-18.9**	60.2	53.4	49.3	50.0
Namibia	19.6	-7.4	-16.8	-17.1	**-18.4**	58.9	51.5	52.9	52.8
Malawi	14.1	-10.0	**-16.5**	-15.9	-16.0	47.5	45.0	48.3	50.1
Zambia	17.0	-13.8	**-15.6**	-13.8	-13.5	40.2	39.2	42.4	44.5
Mozambique	16.1	-3.0	-8.9	-13.6	**-14.4**	46.3	44.0	42.1	43.6
Uganda	6.7	**-11.4**	-9.0	-6.6	-5.7	44.6	47.8	51.5	54.2
Rwanda	3.1	**-11.1**	-5.3	-3.2	-2.5	36.1	43.4	46.2	48.3
Central African Rep.	10.7	-6.9	**-10.1**	-9.8	-9.5	46.1	43.3	44.7	46.5

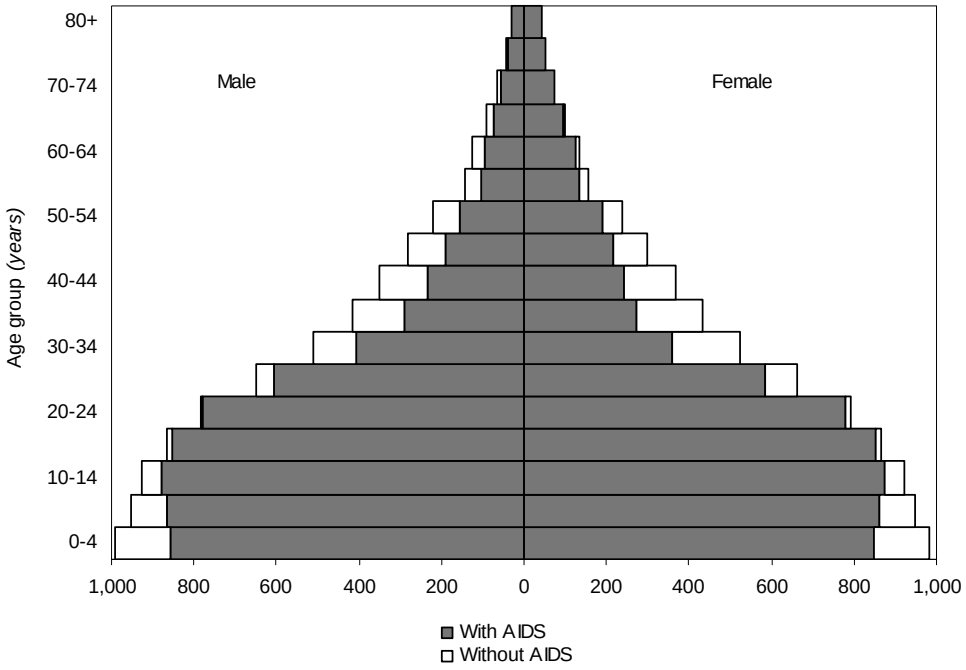
Country	Reduction in population growth rate (percentage points) 1995-2000	2000-2005	2005-2010	2010-2015	Resulting population growth rate (per cent) 1995-2000	2000-2005	2005-2010	2010-2015
Swaziland	-0.3	-1.1	-1.5	**-1.6**	2.0	1.2	0.6	0.5
Zimbabwe	-0.9	**-1.4**	-1.1	-0.8	1.4	0.7	1.0	1.1
Lesotho	-0.3	-1.0	**-1.2**	-1.1	1.8	1.0	0.6	0.6
Botswana	-0.7	**-1.1**	-0.8	-0.8	2.0	1.2	1.2	1.1
South Africa	-0.2	-0.7	**-1.0**	-1.0	1.8	1.1	0.6	0.4
Namibia	-0.3	-0.8	-0.8	**-0.8**	2.5	1.5	1.3	1.2
Malawi	-0.5	**-0.8**	-0.7	-0.6	2.8	2.6	2.6	2.5
Zambia	-0.8	**-0.9**	-0.7	-0.6	2.4	1.9	1.9	1.8
Mozambique	-0.2	-0.5	**-0.8**	-0.7	2.7	2.4	2.0	1.8
Uganda	**-0.6**	-0.4	-0.2	-0.1	3.0	3.2	3.2	3.2
Rwanda	**-0.6**	-0.3	-0.1	-0.1	7.4	2.5	2.8	2.7
Central African Rep.	-0.4	**-0.6**	-0.5	-0.4	2.3	1.6	1.8	1.8

NOTE: In bold are the largest reductions for each country.

points and Rwanda by 0.7 points. Assuming that such declines are part of the normal course of the epidemic, which incorporates behavioural responses, the projections show a declining impact of AIDS over time. Thus the theoretical reduction in life expectancy in Zimbabwe becomes less serious over time, falling from 26 years in 2000-2005 to 23 years in 2005-2010 and eventually down to 10 years by 2045-2050. In Lesotho, the theoretical reduction of 19 years of life expectancy due to AIDS in 2000-2005 is projected to increase initially to 23 years in 2005-2010 before it begins to decline.

In these cases where HIV prevalence is very high, mortality is especially elevated among adults rather than children and among women rather than men. Population pyramids for Zimbabwe in 2005 illustrate this (figure IV.21). Population in the middle of the age structure is reduced proportionally much more than population at the youngest ages. In the middle of the age structure, the reductions are somewhat greater on the female than the male side. On the male side, reductions extend further up into the older ages, given differences in typical ages of sexual partners.

Figure IV.21. Population pyramids for Zimbabwe, 2005, with and without AIDS
(thousands)



Over time, the differences across ages but not between the sexes will appear less notable. As cohorts pass through the most vulnerable ages, more and more age groups will show some reduction relative to the theoretical pattern without AIDS.

Population growth in a few countries has been and will be substantially affected, but none of the changes will be so drastic as to produce, by itself, negative growth. The closest case is Guyana, where negative growth was already in prospect and may have started a couple of years earlier than otherwise. Reductions in population growth are much greater in Africa, but even with AIDS, none of the countries affected will reach negative growth before midcentury. The annual growth rate is Zimbabwe was 1.4 percentage points below what it would have been without AIDS in 2000-2005. In Swaziland, growth will be 1.6 percentage points below the theoretical path by 2010-2015. However, growth in Zimbabwe was still positive in 2000-2005 at 0.7 per cent annually and is expected to rebound to 1.0 per cent by 2005-2020. In Swaziland, annual growth will be 0.5 per cent annually by 2010-2015.

These are the largest reductions in population growth expected in any country, resulting from levels of HIV prevalence of at least 18 per cent throughout Southern Africa (figure IV.22). Since HIV prevalence does not exceed 4 per cent in any country outside Africa, theoretical reductions in population growth are much smaller outside the continent.

For Southern Africa, population in 2005 was 5 per cent below what it could have been without AIDS, will be 21 per cent below by 2025 and 30 per cent below by 2050. The parallel reductions in Eastern Africa are much smaller, at 4 per cent for 2005, 9 per cent for 2025 and 12 per cent for 2050. Outside Africa, the largest reduction by 2050 will be a relatively trivial 4 per cent in the Caribbean.

But the number of deaths due to AIDS is not trivial. In Zimbabwe and the five Southern Africa countries, they are or will shortly be at least half of all deaths and this will be true for 15 to 30 years. Between 2000 and 2005, there were 1.8 million such deaths in Southern Africa, even more, 4.8 million, in Eastern Africa and a total of 13.3 million worldwide (figure IV.23). And the number is rising, with a peak of 17.7 million expected between 2010 and 2015. Numbers may then decline, assuming that appropriate behavioural adjustments reduce the spread of HIV, but the age structure is likely to retain the scars past mid-century.

Figure IV.22. Population growth rates with and without AIDS, by country level of HIV prevalence

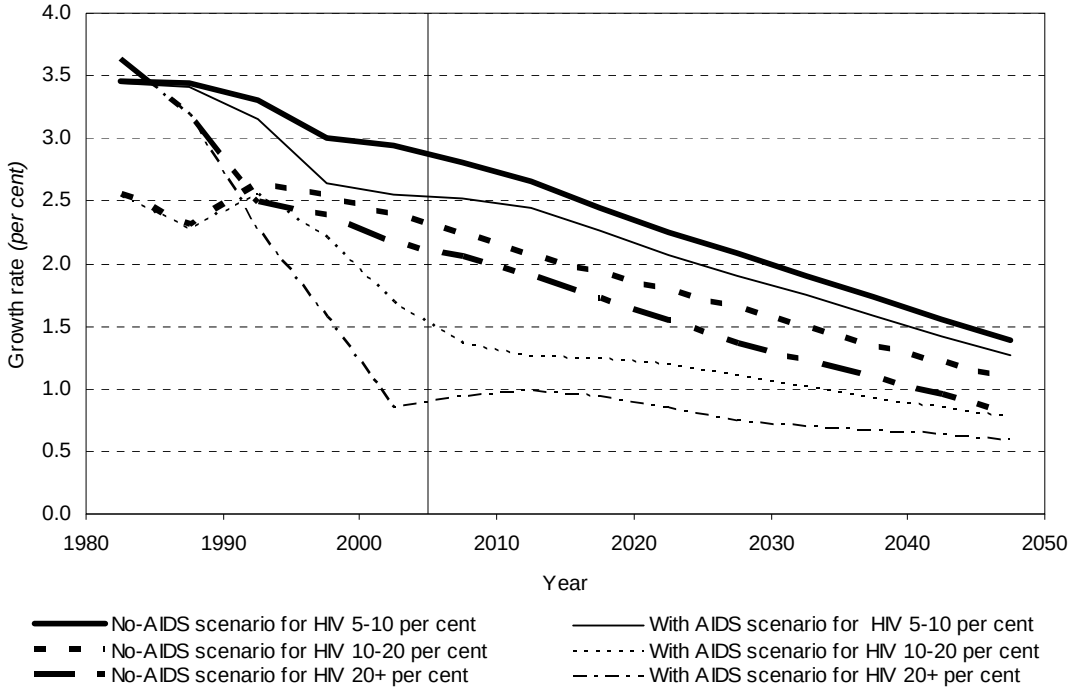
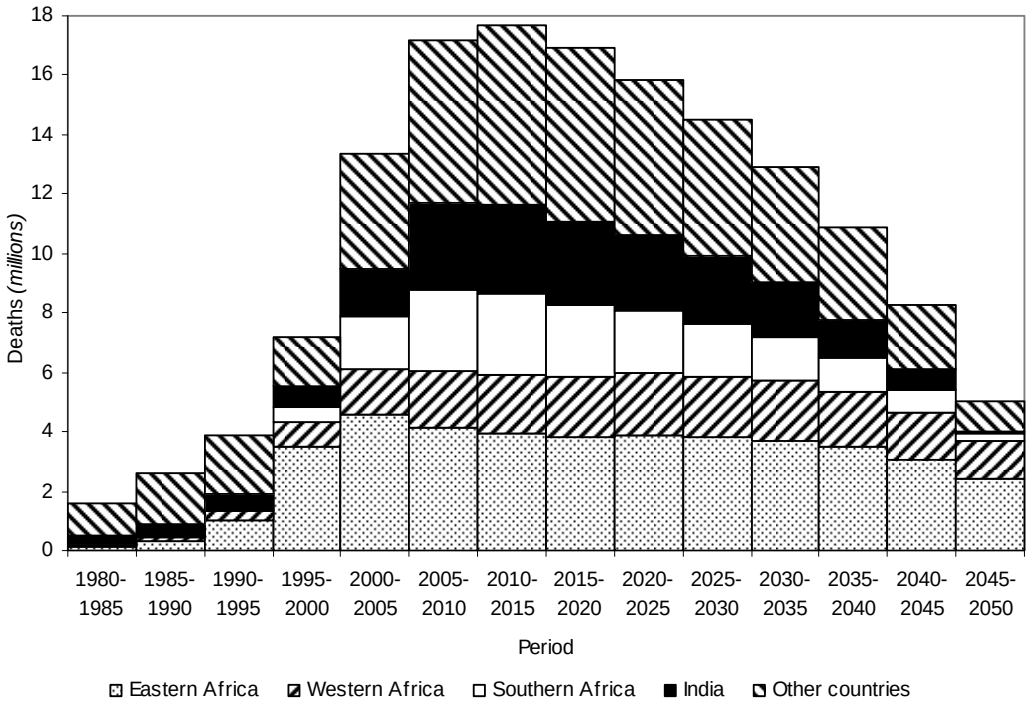


Figure IV.23. Deaths from AIDS, 1980-2050



V. INTERNATIONAL MIGRATION

International migration can be a wild card in population growth. Besides the flows of people across borders in search of a better life, crisis migrants, fleeing desperate situations or returning as conditions calm, have the capacity to upset scenarios for orderly population change.

Migration is less adequately modelled than fertility or mortality for several reasons. These include the inadequacy of statistics, the episodic nature of some flows and the drastic and almost instant impact that changing public policy can have on them. A further limitation is that the estimates and projections only consider net international migration. Offsetting flows of immigrants and emigrants, including circular movements, are concealed in the statistics. Internal migrations, which may be linked to or can set the stage for international flows, are not covered. The many movements an individual can make over a lifetime receive inadequate representation. The focus on net international migration is driven by the need for such figures in modelling population change, not by any intention to slight such other aspects of the process. But it necessarily limits what can be discussed here. This chapter covers, first, the net migrants themselves, their numbers, national origins and destinations and then their impact on population change.

A. INTERNATIONAL MIGRANTS

Over a half century, the growth rate of net international migrants has increased faster than world population. Migrants are coming from more countries and large migration streams are more common. Crises of one sort or another are producing a large though not necessarily dominant share of net international migrants.

1. Volume

In 1950-1955, 62 per cent of countries had between –25.000 and 24,999 net migrants (i.e., 25,000 or fewer net emigrants or fewer than 25,000 net immigrants). By 2000-2005, this proportion had shrunk to 32 per cent of countries (figure V.1). Fewer countries than in previous decades are untouched by international migration, at least at this low level. At higher levels, the proportion of countries affected is also growing. At 100,000 net immigrants or more per quinquennium, the proportion of countries has gone from 8 per cent in 1950-1955 to 21 per cent in 2000-2005. Beyond 100,000 net emigrants per quinquennium, the proportion of countries has gone from 9 to 24 per cent in the same span of time.

Net migrants are moving in larger streams, with more net emigrants coming from large sending countries and more net immigrants moving to large receiving countries. In 2000-2005, 40 per cent of net emigrants were from countries that sent out at least a million of them, as opposed to 0 per cent in 1950-1955. Of net immigrants, 57 per cent (13.6/24.0) in 2000-2005 entered countries that received at least a million of them, as opposed to only 17 per cent (1.1/6.6) in 1950-1955 (figure V.2).

The actual number of net international migrants has grown fairly steadily, reaching a high point of 28.7 million in 1990-1995 (or 5.7 million annually in that period) before falling back a little (table V.1)[1]. The increase from 1985-1990 to 1990-1995 deserves some attention. This increase was 11.3 million, an unprecedented rise of 65 per cent, for an effective annual growth rate of 10.0 per cent. This was far above the long-term average annual growth rate in net migrants from 1950 to 1990 of 2.8 per cent (itself well above the world population growth rate for that period of 1.9 per cent). The subsequent sharp drop in net migrants in the following quinquennium was also unprecedented. Yet the 21.9 million net migrants in 1995-2000 were more numerous than in 1985-1990 and the 24.0 million in 2000-2005 were more numerous still. Whether migration in 1990-1995 was an anomalous spike in a typically more measured upward trend will be considered below.

[1] For the purpose of this report, net immigrants represent the sum of net migrants for all countries with positive net migration and net emigrants correspond to the sum of net migrants for all countries with negative net migration. Net cross-national migrants worldwide are computed as the average absolute number of net immigrants and net emigrants. This is to get a lower bound estimate of worldwide flows since at the world level the two numbers offset one another and net migration is zero.

Figure V.1. Percentage distribution of countries by number of net migrants, 1950-2005

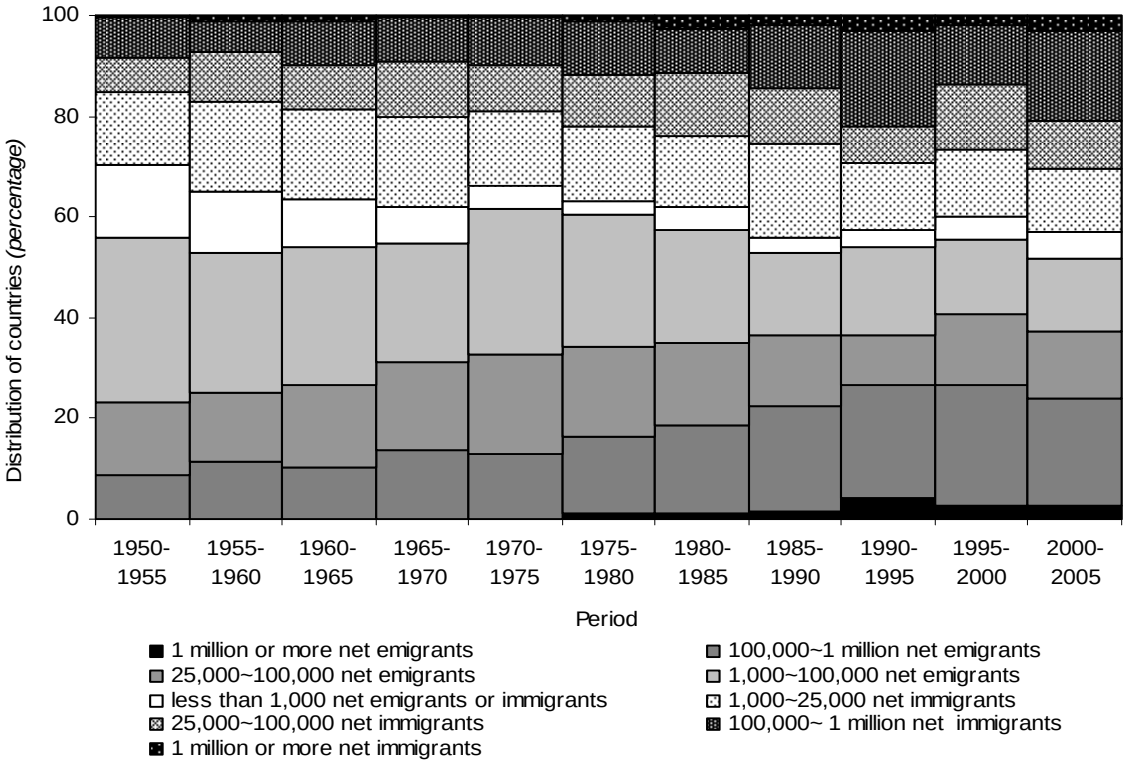


Figure V.2. Total net cross-country migrants worldwide in each quinquennium, by countries classified by size of net migration stream, 1950-2005

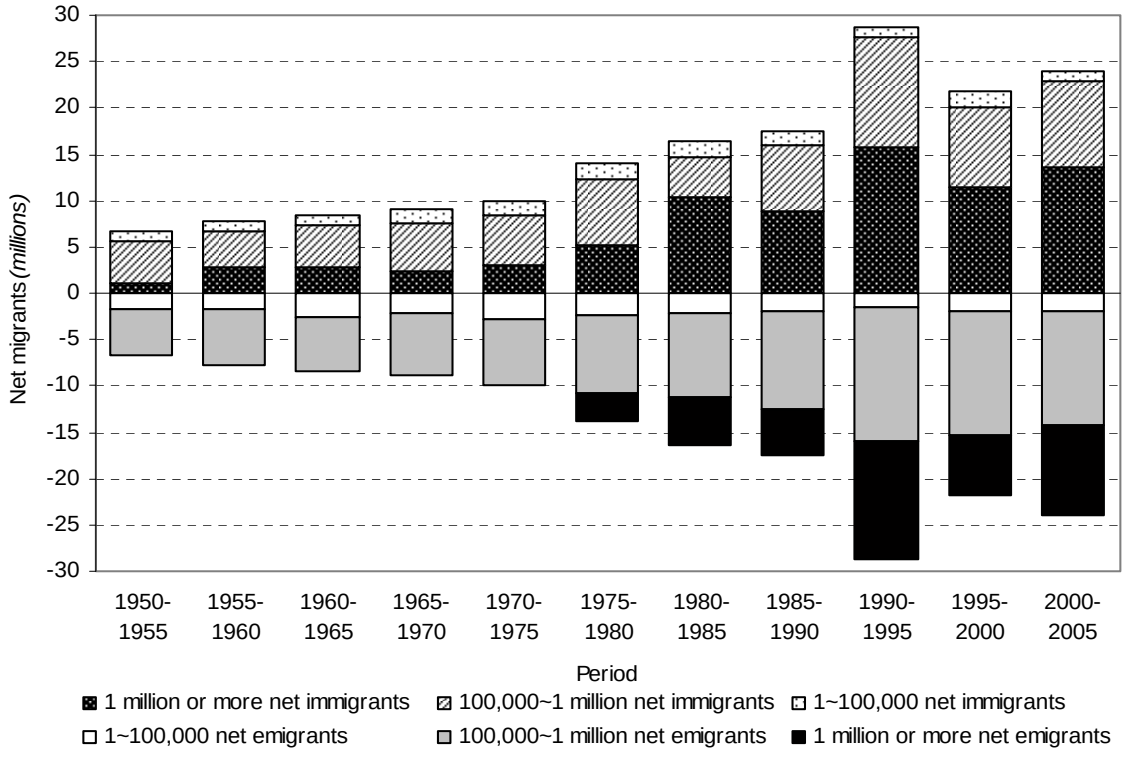


TABLE V.1. ESTIMATED AND PROJECTED NET CROSS-COUNTRY MIGRANTS, FOR THE WORLD AND DEVELOPMENT GROUPS, 1950-2050
(millions per quinquennium)

	World	*More developed regions*			*Less developed regions*			*Least developed countries*			*Other less developed countries*		
Period	*Net cross-country migrants*	*Gain or loss*	*Net immi-grants*	*Net emi-grants*	*Gain or loss*	*Net immi-grants*	*Net emi-grants*	*Gain or loss*	*Net immi-grants*	*Net emi-grants*	*Gain or loss*	*Net immi-grants*	*Net emi-grants*
1950-1955.....	6.59	-0.30	3.11	3.41	0.30	3.50	3.20	-0.50	0.05	0.55	0.80	3.44	2.64
1955-1960.....	7.79	0.27	4.89	4.62	-0.27	2.92	3.19	-0.55	0.16	0.71	0.28	2.76	2.48
1960-1965.....	8.41	2.58	5.71	3.13	-2.58	2.72	5.30	-0.92	0.32	1.24	-1.67	2.39	4.06
1965-1970.....	8.96	2.98	6.08	3.10	-2.98	2.90	5.88	-0.56	0.71	1.27	-2.42	2.19	4.61
1970-1975.....	9.86	4.94	6.19	1.24	-4.94	3.69	8.63	-1.94	0.62	2.55	-3.00	3.07	6.09
1975-1980.....	13.92	5.93	6.78	0.85	-5.93	7.16	13.09	-2.53	2.41	4.94	-3.40	4.75	8.15
1980-1985.....	16.30	5.73	6.96	1.23	-5.73	9.37	15.10	-4.76	1.68	6.44	-0.97	7.68	8.65
1985-1990.....	17.41	9.57	10.83	1.26	-9.57	6.61	16.18	-3.12	2.51	5.63	-6.44	4.10	10.54
1990-1995.....	28.73	12.66	15.53	2.87	-12.66	13.23	25.89	1.44	8.25	6.81	-14.10	4.98	19.08
1995-2000.....	21.88	12.27	14.59	2.32	-12.27	7.32	19.59	-1.81	3.09	4.90	-10.46	4.22	14.68
2000-2005.....	24.02	16.45	17.97	1.52	-16.45	6.07	22.52	-0.43	2.95	3.38	-16.02	3.12	19.14
2005-2010.....	18.44	12.57	13.46	0.89	-12.57	4.99	17.56	0.15	2.71	2.56	-12.72	2.28	15.00
2010-2015.....	15.09	11.40	12.02	0.63	-11.40	3.07	14.48	-1.08	0.99	2.07	-10.32	2.09	12.41
2015-2020.....	13.62	11.28	11.80	0.52	-11.28	1.82	13.10	-1.69	0.19	1.88	-9.59	1.63	11.22
2020-2025.....	13.25	11.33	11.85	0.52	-11.33	1.40	12.73	-1.86	0.01	1.87	-9.47	1.39	10.86
2025-2030.....	13.25	11.36	11.85	0.49	-11.36	1.40	12.76	-1.87	0.01	1.88	-9.49	1.39	10.88
2030-2035.....	13.25	11.36	11.85	0.49	-11.36	1.41	12.77	-1.88	0.01	1.89	-9.48	1.40	10.88
2035-2040.....	13.25	11.36	11.85	0.49	-11.36	1.41	12.77	-1.88	0.01	1.89	-9.48	1.40	10.88
2040-2045.....	13.25	11.36	11.85	0.49	-11.36	1.41	12.77	-1.88	0.01	1.89	-9.48	1.40	10.88
2045-2050.....	13.25	11.36	11.85	0.49	-11.36	1.41	12.77	-1.88	0.01	1.89	-9.48	1.40	10.88

NOTE: Summation of least developed countries and other less developed countries does not necessarily add up to the total of less developed regions due to rounding.

One possible inference from the long-term increase in net migration is that more people are moving from less developed to more developed regions. This does appear to be a major factor. In 1950-1955, net cross-development-group migrants (those who represented a gain or loss to a development group because they came from a different development group and were not offset by reverse movements) totalled 800,000. By 2000-2005, they had increased spectacularly to 16.5 million (figure V.3). However, migrants within development groups, combined with migrants between development groups who were offset by reverse movements, also increased though by much less, from 5.8 to 7.5 million. This second stream actually reached a peak twice as high, at 14.6 million, in 1990-1995 before subsiding.

These two clusters of migrants, the net cross-development-group migrants and other cross-country migrants, are shown separately in the next two figures in order to distinguish the three development groups. figure V.4, showing net cross-development-group migrants, indicates fairly steady trends in opposite directions for more developed regions and less developed regions excluding the least developed countries (i.e., other less developed countries), but figure V.5 indicates more fluctuations than trends for other migrants. In figure V.4, more developed regions have consistently gained migrants from the mid-1950s to the latest period, save for a minor dip in 1995-2000. Less developed regions excluding the least developed countries (i.e., other less developed countries) have consistently lost migrants, with the greatest loss being in the most recent period. Least developed countries, in particular, have lost fewer migrants than other less developed countries, except in 1980-1985 and in 1990-1995 actually gained migrants.

Figure V.3. Net migrants worldwide, across countries and across development groups, 1950-2050

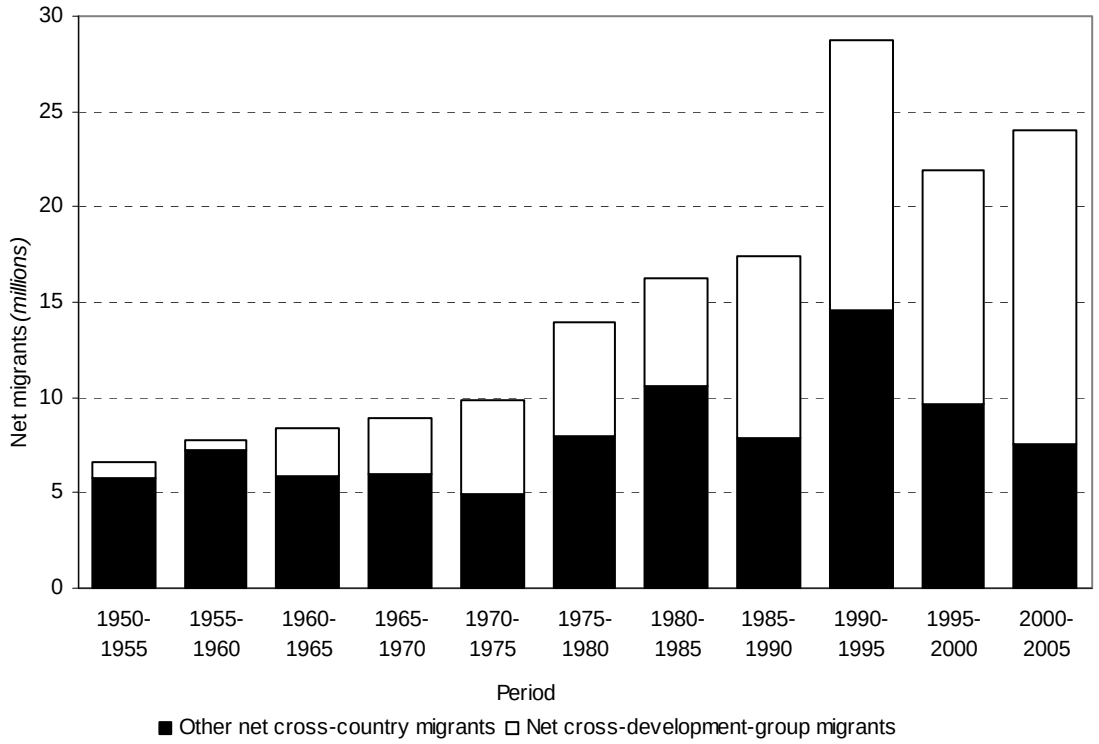


Figure V.4. Net cross-development-group migrants, by development group, 1950-2050

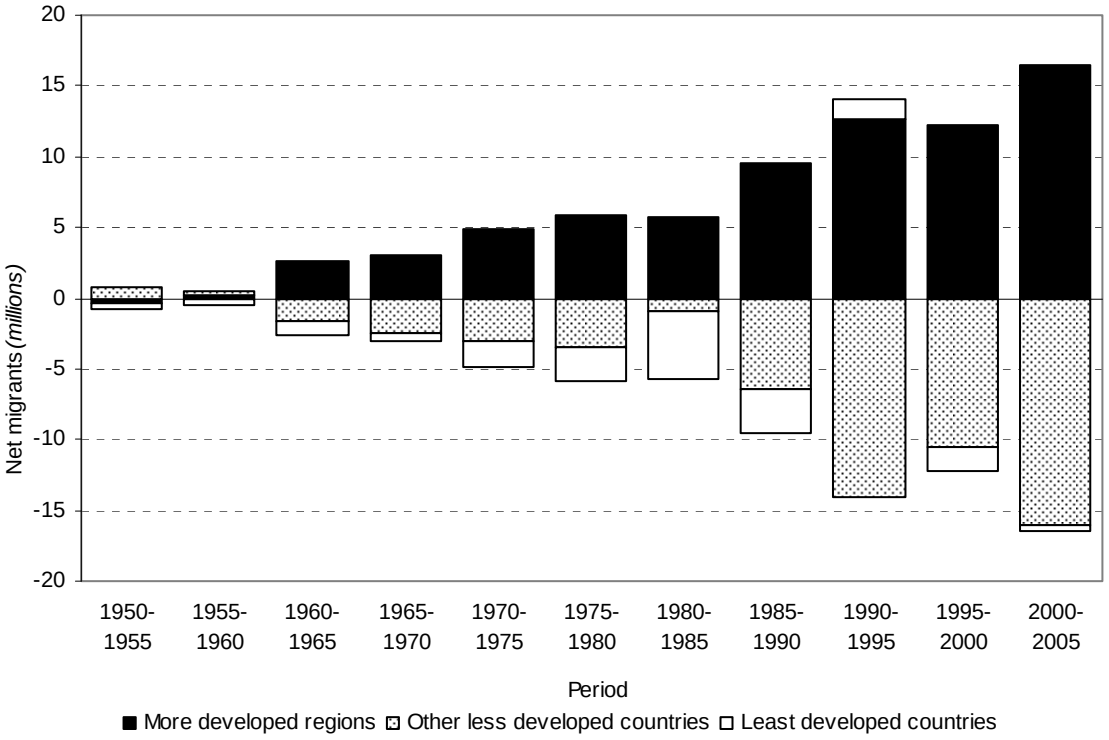


Figure V.5. Net cross-country immigrants who stay in a development group or are offset by emigrants from the development group, 1950-2050

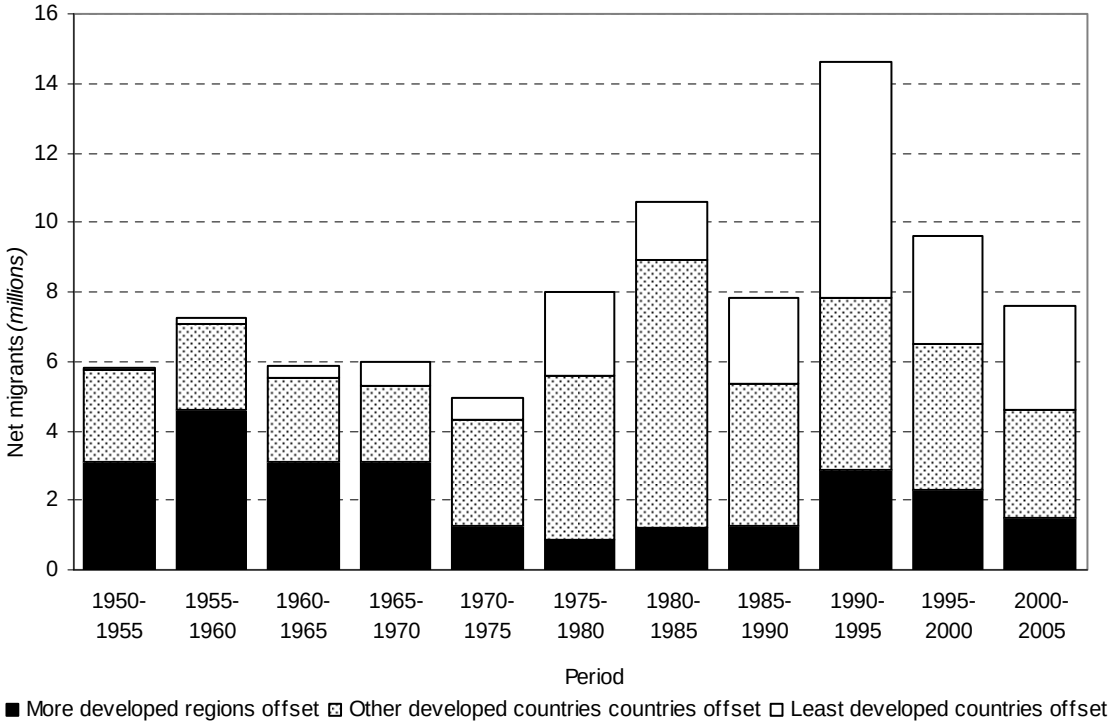


Figure V.5 shows a contrasting pattern for the other cluster of net migrants for a development group, those who stay within the group or are offset by migrants out of it. Only net immigrants are shown, given that net emigrants are by definition equal in number. Numbers do not trend either upward or downward for more developed regions or less developed regions (excluding the least developed countries), though in these other less developed countries there was a spike in numbers in 1980-1985. In least developed countries, an upward trend is evident, with a large spike in 1990-1995. Least developed countries appear mostly responsible for the unusual number of net international migrants in 1990-1995.

2. Major flows

The refugee flow out of and into Afghanistan (which is among the least developed countries) is in fact the largest factor in the surge in migrants in 1990-1995. A total of 3.3 million are estimated to have returned to Afghanistan in this quinquennium, after 4.8 million had left in the previous two quinquennia. Pakistan and Iran were the main countries from which refugees returned. Before 1975, net immigrants or net emigrants for these three countries had never reached 100,000 in any quinquennium. In 1975-1980, net migrants for Afghanistan hit 1.1 million and the numbers have fluctuated wildly since then (figure V.6).

A few other countries have been in a somewhat similar situation—though not necessarily in the same period—gaining or losing a million or more net migrants in a quinquennium during a crisis or after it was resolved. Rwanda, after several somewhat quiescent decades where international migration is concerned, had 1.7 million net emigrants in 1990-1995 around the time of the genocide and 2.0 million net immigrants in the following quinquennium. The neighbouring Democratic Republic of the Congo may have temporarily taken in about 70 per cent of the refugees (figure V.7). Ethiopia and Somalia have had a more complicated history, with push factors from both directions at different times. Mozambique and Bosnia and Herzegovina have also had crises and related outflows reaching a million people in 1985-1990 and 1990-1995 respectively. However, inflows did not reach a million in any of the individual recipient countries. These figures are of course somewhat uncertain, given the difficulties of counting refugees.

Figure V.6. Net migrants in each quinquennium: Afghanistan, Pakistan and Iran, 1975-2005

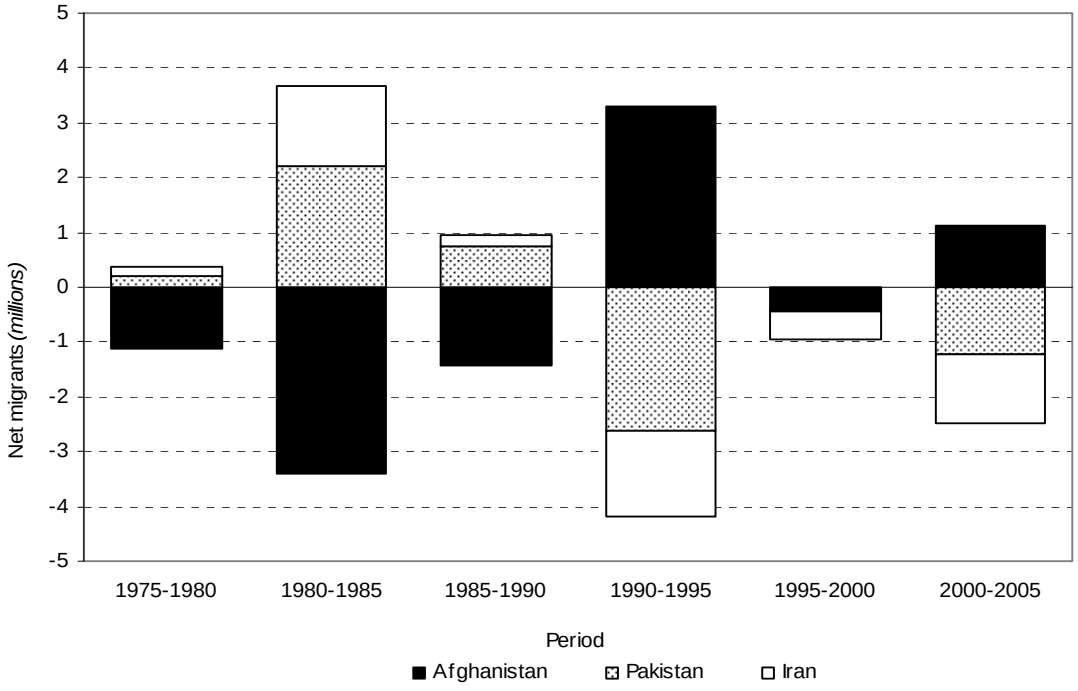
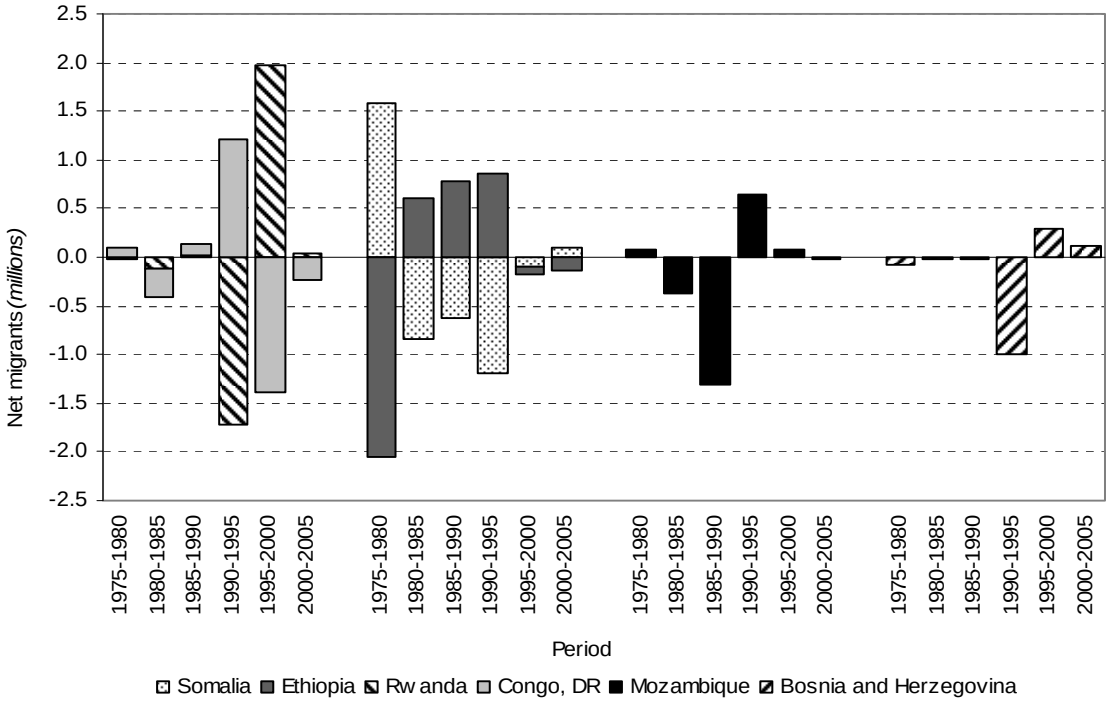


Figure V.7. Net migrants in each quinquennium: additional countries where crises produced at least one million, 1975-2005



Counting other migrants is not necessarily any easier, though one generally assumes fewer abrupt changes in flows. From 1975 to 2005, seven countries have had a total of at least 2.5 million net immigrants and seven others have had a total of at least 2.5 million net emigrants (figure V.8). These numbers generally represented a substantial boost over flows in the preceding 25 years. Individually, these countries have had more net immigrants or emigrants over the span from 1975 to 2005 than any of the crisis-affected countries previously noted. But only in a few cases did the flows reach a million net immigrants or emigrants in any quinquennium.

The flow did reach these levels in the United States and Mexico, which have had by far the largest numbers of net immigrants and emigrants respectively (table V.2). From 1975 to 2005, the United States accepted 29.9 million net immigrants (figure V.9). In each quinquennium in that span, it absorbed between 18 and 28 per cent of all net immigrants worldwide. The numbers for Mexico are smaller but still impressively large: 11.8 million net emigrants since 1975 and a share of all world net emigrants rising from 6 per cent in 1975-1980 to 17 per cent in 2000-2005. The next two major receiving countries in 1975-2005 could be considered as affected by crisis-motivated return migrants, though the crises were probably not as acute as those previously noted. Both Germany and the Russian Federation accepted substantial numbers of immigrants at the end of the Cold War and the collapse of the Soviet Union. The major sending countries in 1975-2005 were mainly large countries with many economic migrants. After Mexico came China, India and the Philippines. The fifth in line, Kazakhstan, sent return migrants to the Russian Federation at the end of the Soviet Union.

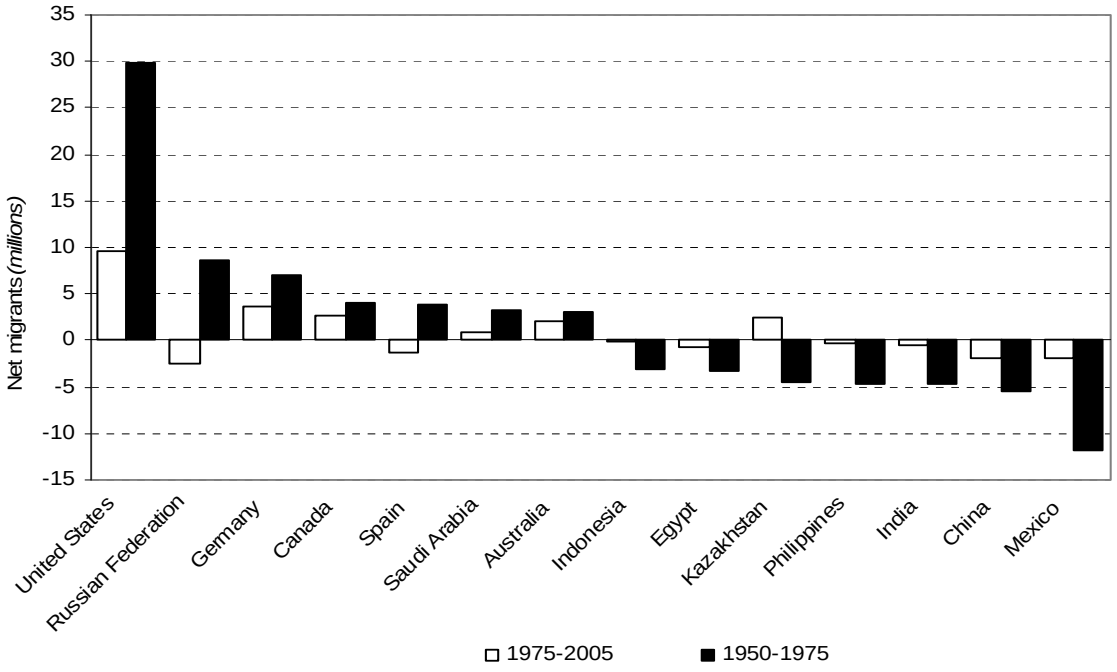
3. Major world areas and regions

The 14 countries in figure V.8 accounted collectively for 49 per cent of all net immigrants in 1975-2005 and 31 per cent of all net emigrants. To indicate where the other net migrants were, it is helpful to look at aggregate numbers (table V.3). Net cross-national immigrants[2] by major world area, for those countries that had net immigration and net cross-national emigrants[3], for other countries, are distinguished in figure V.10 and the balance—net cross-area migrants—is shown in figure V.11.

[2] Net cross-country immigrants are obtained by summing net migrants for all countries with positive net migration.

[3] Net cross-country emigrants are obtained by summing net migrants for all countries with negative net migration.

Figure V.8. Countries with 2.5 million or more net immigrants or emigrants in 1975-2005



With the United States and Canada receiving large numbers of immigrants, Northern America has the simplest pattern in the figures, a rising, mostly monotonic trend, reaching 7.5 million net immigrants by 2000-2005. Oceania also has a fairly straightforward trend, a steady gain in migrants, though at a much lower level and with more ups and down. From 1985 to 2005, net immigrants in Oceania averaged a little over 500,000 per quinquennium. No net emigrants are shown for either area. The two countries of Northern America had only net immigration, whereas the mostly small island countries of Melanesia, Micronesia and Polynesia had too few net emigrants to be visible in the figure.

Europe is the other major area with positive net migration (figure V.10). In 2000-2005, it accounted for 39 per cent of net immigrants, more than Northern America (31 per cent). Europe also had some countries with net emigration, though even when net emigrants are subtracted, Europe still accepted more net immigrants than Northern America in 2000-2005. Looking back further, however, the pattern for Europe has been uneven and a substantial gap between net immigrants and net emigrants began to open up only in the late 1980s.

In the 1950s and 1960s, Europe had more net emigrants than any other major world area. Their numbers have declined since then and been overtaken by burgeoning numbers from other areas. Asia has become the main source of cross-country migrants, accounting for a growing proportion of net emigrants that reached 47 per cent by 2000-2005. Past peaks in net emigration from Asian countries have been partly balanced by peaks of net immigrants, as more people move between Asian countries. However, increasingly large and steady outward flows from such countries as China, India, the Philippines and Bangladesh now ensure that, overall, net emigrants are more numerous than net immigrants. In 2000-2005, net immigrants for Asia were also numerous, at 18 per cent of the total worldwide. Of these Asian net immigrants, 27 per cent went into Afghanistan and 30 per cent into Western Asian countries.

Latin America and the Caribbean countries and African countries had approximately equal net emigrants over the span from 1980 to 2005. However, Latin America and Caribbean countries received few net immigrants, so that the area lost about 3 million more net migrants than Africa in each quinquennium in that span. Net migrants in 2000-2005 reached –6.8 million in Latin America and the Caribbean, close to the –7.1 million for Asia, driven mostly by the –4.0 million for Mexico.

TABLE V.2. NET IMMIGRANTS OR EMIGRANTS IN COUNTRIES WITH THE LARGEST NUMBER OVER LONG PERIODS OR IN PARTICULAR QUINQUENNIA BETWEEN 1950 AND 2050

(millions of net migrants)

Country	*Total migrants gained or lost*		*Largest gain in any quinquennium*		*Largest loss in any quinquennium*		*Last two quinquennia*	
	1950-1975	*1975-2005*	*(Period)*	*No.*	*(Period)*	*No.*	*1995-2000*	*2000-2005*
Countries with 2.5 million or more net immigrants than emigrants in 1975-2005								
United States of America	9.68	29.92	(2000-2005)	6.49	..	..	6.20	6.49
Russian Federation	-2.57	8.64	(1990-1995)	2.26	(1955-1960)	-0.97	2.19	0.92
Germany	3.59	7.00	(1990-1995)	2.69	(1980-1985)	-0.11	1.13	1.00
Canada	2.70	4.04	(2000-2005)	1.04	..	..	0.73	1.04
Spain	-1.36	3.80	(2000-2005)	2.85	(1955-1960)	-0.52	0.79	2.85
Saudi Arabia	0.81	3.18	(1980-1985)	1.40	(1985-1990)	-0.50	0.07	0.29
Australia	2.04	2.98	(2000-2005)	0.59	..	..	0.47	0.59
Countries with 2.5 million or more net emigrants than immigrants in 1975-2005								
Mexico	-1.86	-11.80	..	..	(2000-2005)	-3.98	-1.19	-3.98
China	-1.92	-5.53	..	..	(2000-2005)	-1.90	-1.34	-1.90
India	-0.61	-4.69	..	..	(1995-2000)	-1.40	-1.40	-1.35
Philippines	-0.34	-4.59	..	..	(1985-1990)	-0.90	-0.90	-0.90
Kazakhstan	2.43	-4.42	(1955-1960)	1.04	(1985-1990)	-1.51	-1.32	-0.20
Egypt	-0.76	-3.33	(1955-1960)	0.02	(1975-1980)	-0.75	-0.55	-0.53
Indonesia	-0.13	-3.18	..	..	(2000-2005)	-1.00	-0.90	-1.00
Other countries with 1 million or more net immigrants in any quinquennium since 1950								
Afghanistan	0.00	-1.92	(1990-1995)	3.31	(1980-1985)	-3.39	-0.40	1.11
Pakistan	-0.19	-0.75	(1980-1985)	2.20	(1985-1990)	-2.61	-0.04	-1.24
Rwanda	-0.17	0.20	(1995-2000)	1.98	(1985-1990)	-1.71	1.98	0.04
Somalia	0.00	-1.07	(1975-1980)	1.59	(1985-1990)	-1.19	-0.10	0.10
France	3.42	1.96	(1960-1965)	1.47	..	..	0.10	0.72
Iran (Islamic Rep. of)	-0.04	-1.52	(1980-1985)	1.46	(1985-1990)	-1.59	-0.53	-1.25
Democratic Rep. of he Congo	0.57	-0.48	(1990-1995)	1.21	(1995-2000)	-1.38	-1.38	-0.24
Italy	-1.96	2.25	(2000-2005)	1.13	(1955-1960)	-0.51	0.60	1.13
South Africa	0.59	1.72	(1990-1995)	1.12	(1985-1990)	-0.12	0.39	0.08
Other countries with 1 million or more net emigrants in any quinquennium since 1950								
Ethiopia	-0.16	-0.01	(1990-1995)	0.87	(1975-1980)	-2.04	-0.08	-0.14
Mozambique	-0.12	-0.88	(1990-1995)	0.65	(1985-1990)	-1.30	0.08	-0.02
Bosnia and Herzegovina	-0.55	-0.72	(1995-2000)	0.29	(1990-1995)	-1.00	0.29	0.12

NOTE: Either no gain or no loss in any quinquennium since 1950.

Figure V.9. Net migrants by quinquennium for countries with the most immigrants or emigrants in 1975-2005

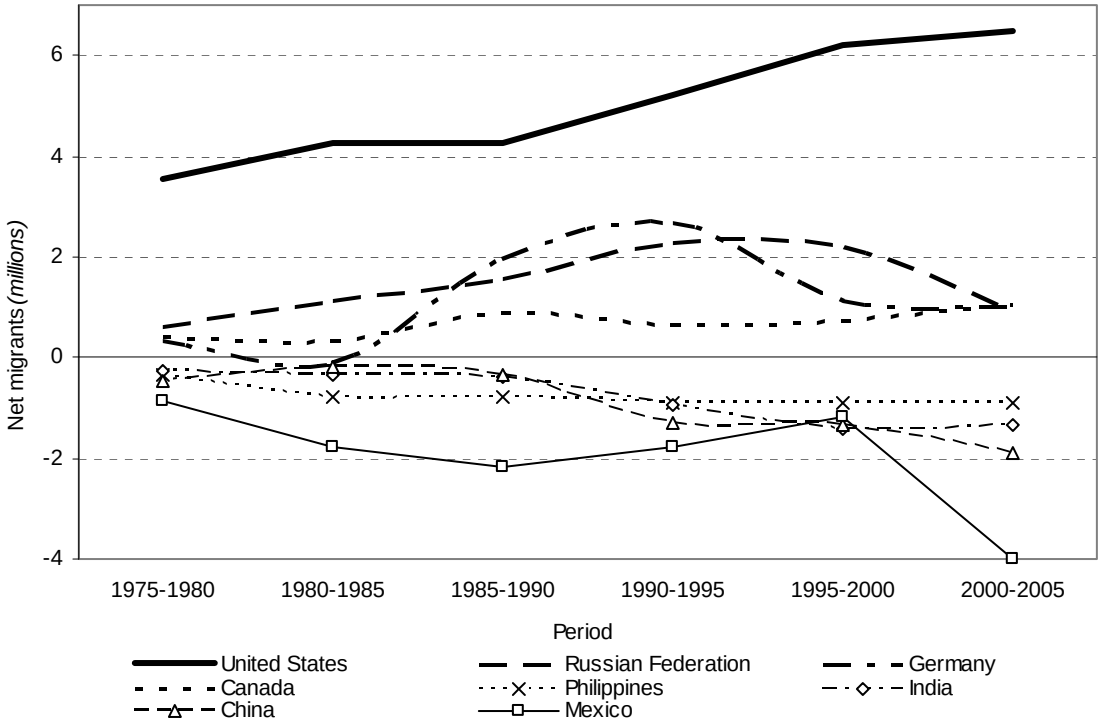


Figure V.10. Net cross-country immigrants and emigrants for countries in each major world area, 1950-2050

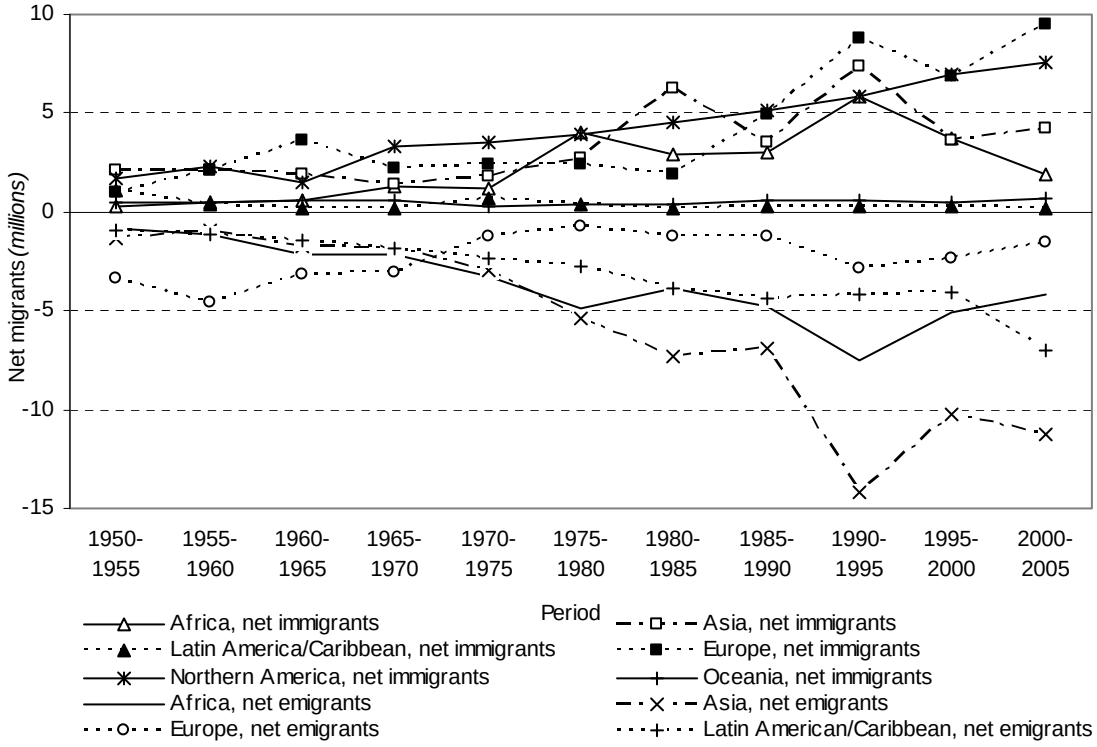


TABLE V.3. NET CROSS-COUNTRY IMMIGRANTS AND EMIGRANTS FOR MAJOR WORLD AREAS AND REGIONS, SELECTED PERIODS *(thousands)*

	Gain or loss			*Net immigrants*			*Net emigrants*		
Major world area and region	*1975-1980*	*1995-2000*	*2000-2005*	*1975-1980*	*1995-2000*	*2000-2005*	*1975-1980*	*1995-2000*	*2000-2005*
Africa	**-886**	**-1,416**	**-2,209**	**4,019**	**3,711**	**1,944**	**4,905**	**5,129**	**4,153**
Eastern Africa	-698	1,067	-118	1,819	2,174	594	2,517	1,108	712
Middle Africa	-12	-1,369	111	196	137	410	208	1,505	299
Northern Africa	-424	-1,398	-1,676	514	37	100	938	1,434	1,776
Southern Africa	11	379	52	85	427	95	74	48	43
Western Africa	237	-96	-579	1,406	937	745	1,168	1,033	1,324
Asia	**-2,621**	**-6,612**	**-7,066**	**2,716**	**3,607**	**4,192**	**5,337**	**10,219**	**11,258**
Eastern Asia	-331	-914	-1,435	355	595	595	686	1,509	2,030
South-Central Asia	-1,745	-5,310	-4,664	393	0	1,147	2,138	5,310	5,811
South-Eastern Asia	-1,275	-788	-1,619	321	1,469	695	1,596	2,258	2,314
Western Asia	729	400	653	1,646	1,543	1,756	917	1,143	1,103
Europe	**1,711**	**4,552**	**7,952**	**2,415**	**6,862**	**9,460**	**717**	**2,318**	**1,522**
Eastern Europe	197	739	116	623	2,290	1,052	426	1,551	936
Northern Europe	153	603	1,409	240	784	1,456	92	186	49
Southern Europe	748	1,632	4,121	840	2,212	4,647	98	581	536
Western Europe	613	1,578	2,307	712	1,576	2,305	101	0	0
Latin America and the Caribbean	**-2,381**	**-3,865**	**-6,832**	**419**	**250**	**178**	**2,786**	**4,119**	**7,016**
Caribbean	-602	-558	-550	0	5	10	590	566	566
Central America	-1,309	-1,863	-4,695	27	139	92	1,336	2,002	4,787
South America	-469	-1,444	-1,588	392	107	76	861	1,551	1,664
Northern America	**3,926**	**6,930**	**7,533**	**3,929**	**6,933**	**7,534**	**0**	**0**	**0**
Oceania	**252**	**412**	**623**	**434**	**516**	**702**	**172**	**91**	**75**
Australia/New Zealand	320	508	695	429	508	695	109	0	0
Melanesia	-36	-44	-37	0	6	5	36	49	42
Micronesia	-4	-23	-9	0	0	1	2	18	10
Polynesia	-29	-30	-26	4	2	2	25	24	23

Net cross-area migration for Africa in 2000-2005, much more moderate at –2.2 million, reflected a balance between 4.2 million net emigrants and 1.9 million net immigrants. As in Asia, the past trend includes peaks for net emigrants that were partly balanced by peaks for net immigrants, particularly in 1975-1980 and 1990-1995. These periods correspond to particularly troubled times in some countries of the continent that generated large refugee flows or subsequent return migration, as discussed earlier.

Among the regions that make up these major world areas, those with the most net immigrants in 2000-2005 are an unsurprising list: Northern America, followed by three European regions—Southern, Western and Northern in that order—and Australia/New Zealand (figure V.12). Those with the most net emigrants are Central America (including Mexico), South-Central Asia (with India and other large countries) and Northern Africa (where Egypt, Morocco and Sudan each had 500,000 or more net emigrants each). In each of these regions, both the sending and receiving ones, the numbers have risen since 1975-1980.

4. Future flows

Crises such as those that mar the record for Africa and Asia, including smaller ones not discussed, left 8.7 million refugees worldwide by the end of 2005 and 9.9 million by the end of 2006 (United Nations High Commissioner for Refugees 2007a, 2007b)[4]. Though some of the

[4] There were in addition 12.8 million internally displaced persons by the end of 2006, suggesting the scale of the impact not captured in net cross-national migrant figures (United Nations High Commissioner for Refugees 2007a).

Figure V.11. Net cross-area migrants for each major world area, 1950-2050

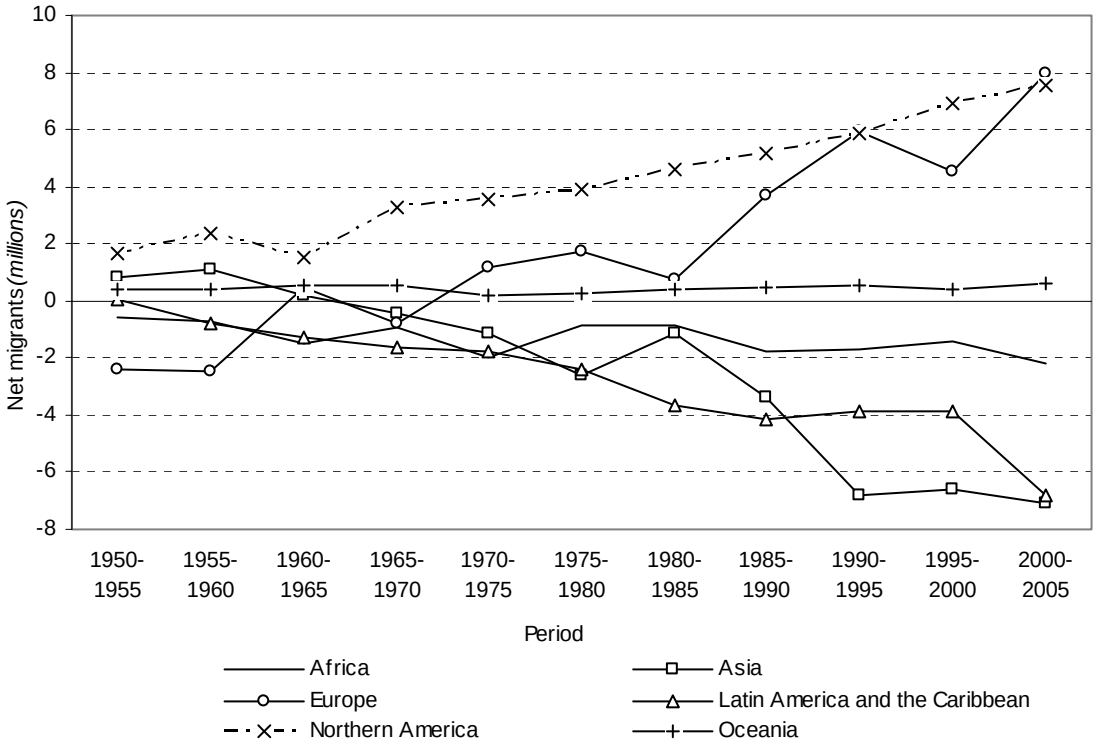
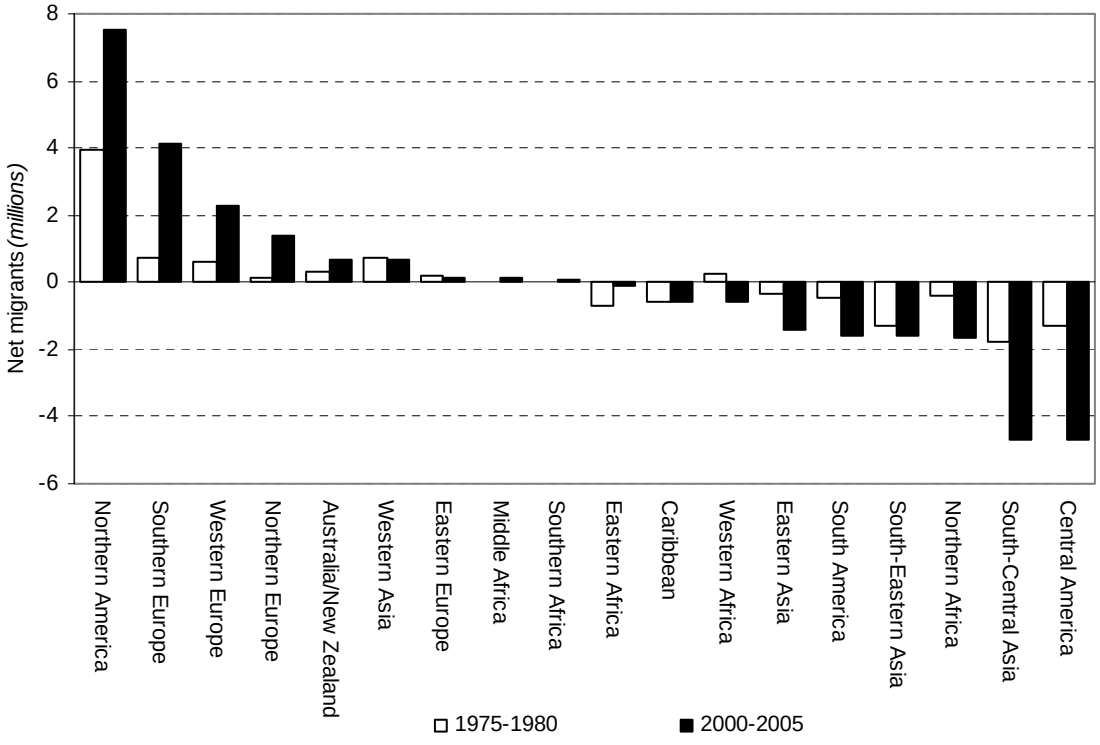


Figure V.12. Net cross-region migrants in 18 geographical regions, 1975-1980 and 2000-2005



refugees will be resettled elsewhere, the projections of future migration assume that the majority will return to their home countries, generally within a decade. The projections also assume no further such refugees. This is not out of blithe optimism about the future but because where and when such crises will explode and what migration flows will result, is not predictable. When they do occur, projections for the affected countries will obvious require revision.

The projections are also conservative in the way they deal with other migrants. The volume of noncrisis migrants is assumed to remain stable in the future at recent levels, subject to what is known or can be surmised about the nature of the flows and the impact of national policies. For the United States, for instance, long-run net migrants are set at approximately the average level for 1985-2005 (figure V.13). For Germany, in contrast, the surge in net immigrants in 1985-1995 is considered temporary and long-run numbers are projected to return to pre-1975 levels. The Russian Federation is treated as an intermediate case, where the rise in net migration from 1975 on is not entirely reversed in future projections, which however assume fewer net migrants than at the peak. Among the four major sending countries, current levels are essentially maintained in the projections, though for Mexico 2000-2005 levels are treated as a temporary phenomenon and projections cut back from these.

To this conservative projection approach, assuming stability in numbers with no crisis-driven flows, there is no easy alternative. In any particular period for any specific country, a spike in migration is unlikely, even if, in the aggregate, one may well occur somewhere. In addition, continued heavy migrant flows often approach some limit, as better economic balance is gradually achieved or problems of assimilation hinder further flows. It is important to recognize, however, that the approach taken in the projections understates the future role of international migration. From the 1950s to 2005, either net immigrants or net emigrants have been increasing in each major world area. But from 2005 onward, net migrants are projected to decline slightly for a decade and then stay stable up to mid-century (figure V.14). On the basis of the record since 1950, this may appear to be a conservative scenario, though it has the benefit of neutrality.

B. MIGRATION RATES AND POPULATION GROWTH

The large countries that produce or accept the most migrants are not necessarily those most affected demographically. The demographic impact on them tends to be small, as it is in general across countries, but countries with the smallest populations can be greatly affected.

1. Highest and lowest rates

Between 1950 and 2005, annual net migrants by country, whether immigrants or emigrants, were less than 0.5 per cent of the population about 70 per cent of the time. The exceptions, however, have been dramatic and have mainly involved smaller countries (table V.4). The largest net migration flow relative to population was into the United Arab Emirates in 1970-1975, when the annual net migration rate reach 13.9 per cent. This was also exceptional because it was the peak of a period of sustained immigration. Over the entire span from 1960 to 2005, net migration for the United Arab Emirates averaged 6.0 per cent and never fell below 3.0 per cent. Other Gulf countries have also had substantial, if not quite as large, migration flows. Qatar had an average net migration rate over the span from 1960 to 2005 of 4.3 per cent and Kuwait had 2.0 per cent. These were three of the five highest average net migration rates for 1960-2005. The other two involved the sparsely settled Western Sahara (3.2 per cent) and Djibouti (2.3 per cent).

Figure V.13. Estimated and projected net migrants by quinquennium for countries with the most immigrants or emigrants, 1950-2050

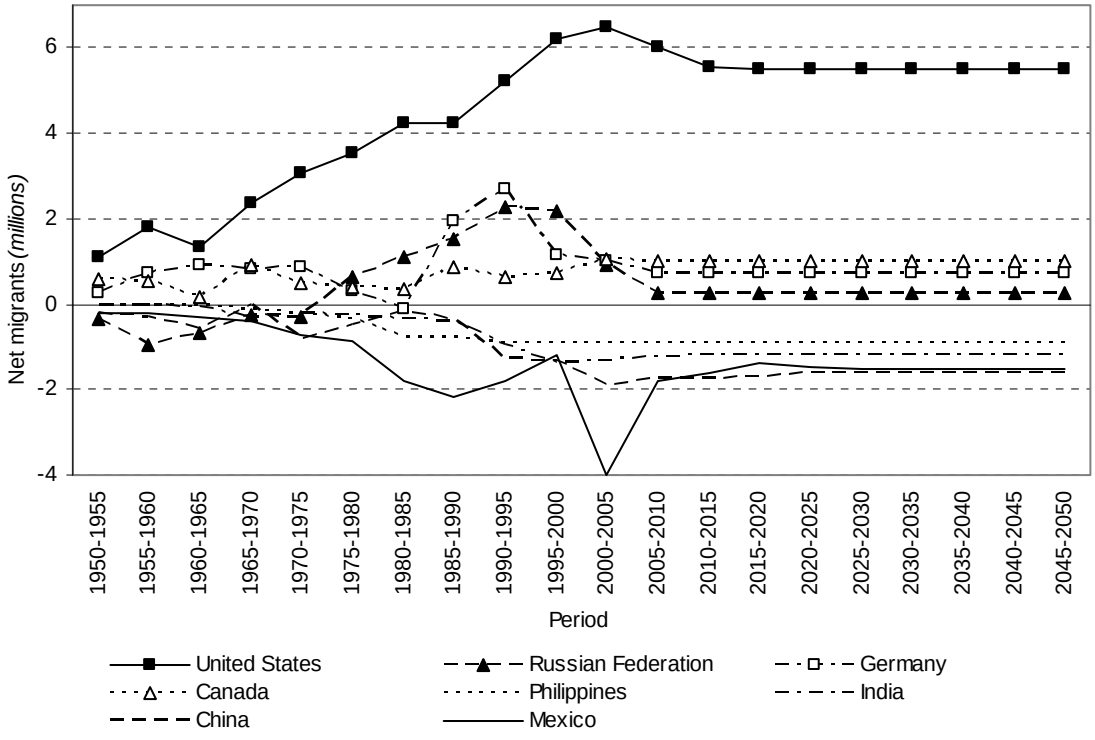


Figure V.14. Net cross-area migrants for each major world area, 1950-2050

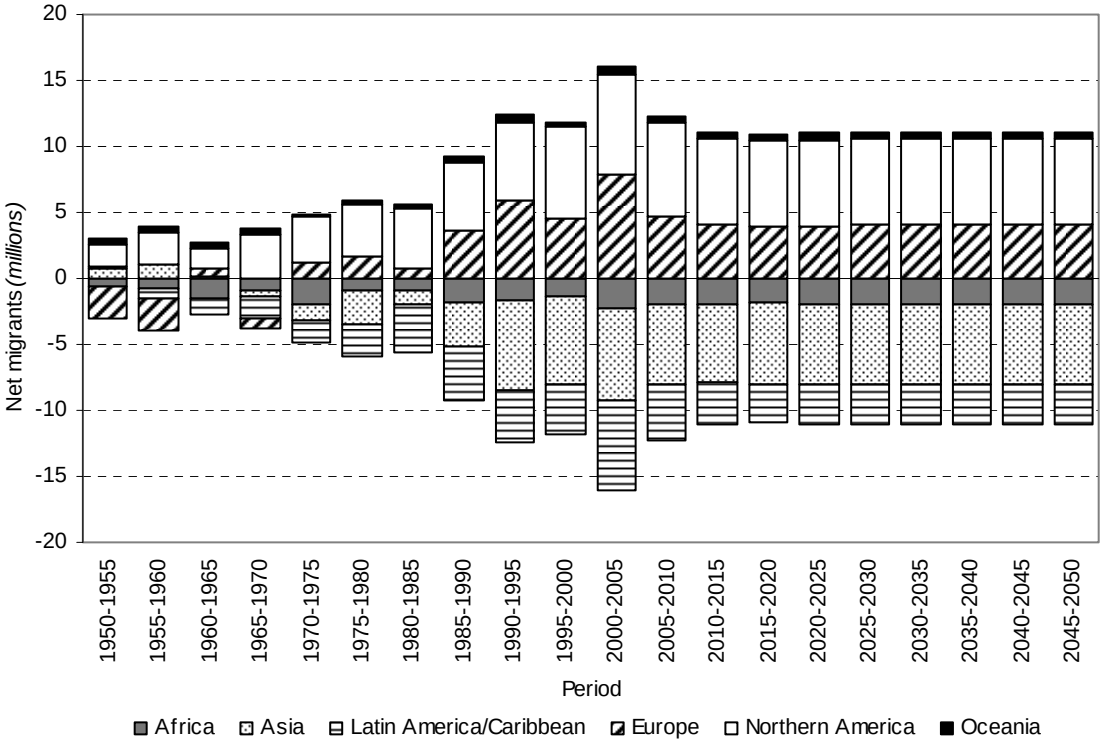


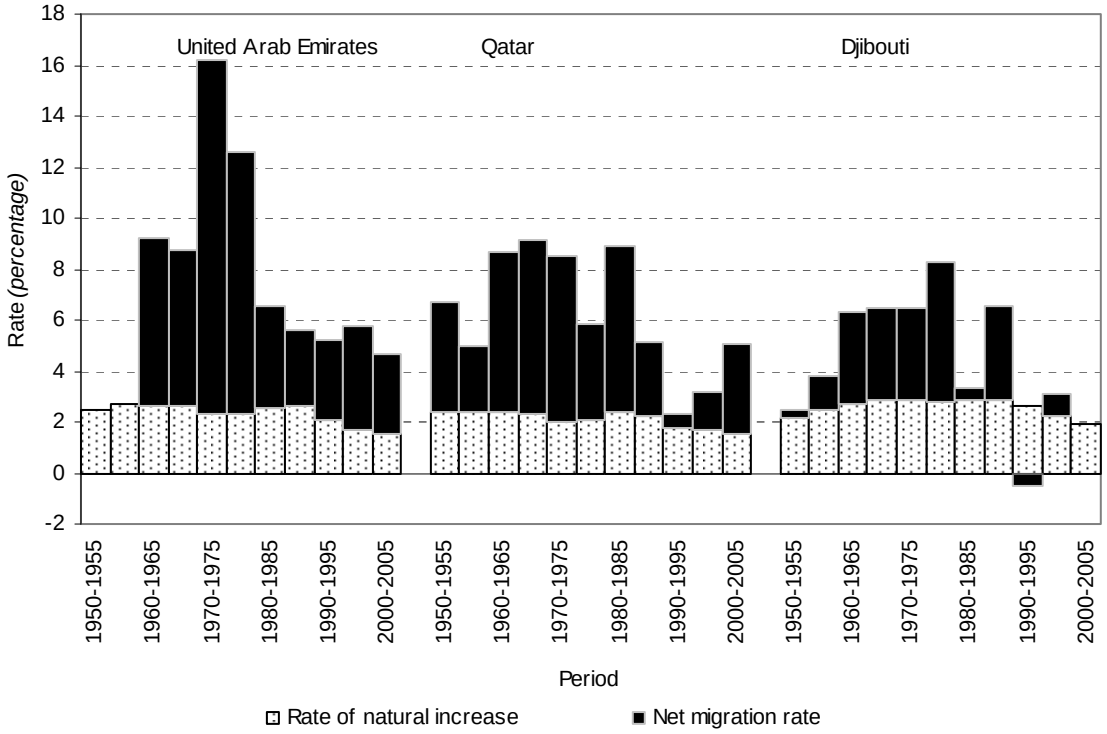
TABLE V.4. NET MIGRATION RATE AND RATE OF NATURAL INCREASE FOR COUNTRIES WITH THE HIGHEST AND LOWEST AVERAGE RATES FOR 1960-2005 OR IN PARTICULAR QUINQUENNIA BETWEEN 1950 AND 2050 *(per cent)*

	1960-2005 mean		*Maximum net migration rate*			*Minimum net migration rate*			*2000-2005*	
Country	*Net migration rate*	*Natural increase*	*Period*	*Net migration rate*	*Natural increase*	*Period*	*Net migration rate*	*Natural increase*	*Net migration rate*	*Natural increase*
Countries with average net migration rates > 1.2 per cent for 1960-2005										
United Arab Emirates	6.00	2.27	1970-75	13.88	2.31	1955-60	0.00	2.68	3.14	1.52
Qatar	4.28	2.03	1965-70	6.83	2.29	1990-95	0.57	1.78	3.56	1.52
Western Sahara	3.22	2.45	1975-80	10.81	2.61	1970-75	-2.95	2.45	4.76	1.86
Djibouti	2.32	2.63	1975-80	5.46	2.78	1990-95	-0.51	2.65	0.00	1.94
Kuwait	2.04	2.95	1960-65	6.74	3.55	1990-95	-6.18	1.86	2.15	1.68
French Guiana	1.66	2.28	1985-90	3.05	2.49	1950-55	0.22	2.08	0.67	2.34
Countries with average net migration rates < -1.2 per cent for 1960-2005										
Tonga	-1.88	2.71	1950-70	0.00	3.66	1970-75	-3.83	2.83	-1.61	1.87
Samoa	-1.68	2.83	1955-60	-0.26	3.35	1980-85	-2.69	2.93	-1.66	2.37
Grenada	-1.58	1.93	1980-85	0.00	2.31	1985-90	-3.01	2.21	-0.03	0.96
Guyana	-1.46	2.04	1955-60	0.33	2.80	1985-90	-2.29	1.67	-1.09	1.22
St. Vincent and the Grenadines	-1.38	2.24	2000-05	-0.85	1.39	1965-70	-2.10	3.11	-0.85	1.39
Suriname	-1.30	2.28	1950-55	-0.11	3.12	1970-75	-3.13	2.71	-0.72	1.44
Other countries with a net migration rate > 5 per cent in any quinquennium										
Somalia	-0.25	2.60	1975-80	5.98	2.88	1990-95	-3.68	2.22	0.26	2.73
Rwanda	-0.11	2.68	1995-00	5.72	1.61	1990-95	-5.30	0.20	0.10	2.33
U.S. Virgin Islands	0.27	2.44	1960-65	5.06	3.20	1985-90	-2.21	1.93	-0.72	0.89
Equatorial Guinea	-0.53	1.97	1980-85	5.03	2.03	1970-75	-7.01	1.69	0.00	2.34
Other countries with a net migration rate < -5 per cent in any quinquennium										
Bosnia and Herzegovina	-0.64	1.10	1995-00	1.63	0.40	1990-95	-5.18	0.58	0.60	0.07
Afghanistan	-0.47	2.59	1990-95	4.29	2.95	1980-85	-5.16	2.70	0.97	2.81

Each of these countries also had high fertility. In 1960-1965, total fertility was between 6.6 and 7.8 children per woman in each country. By 2000-2005, it had fallen to 2.3 in Kuwait but was still 4.5 in Djibouti. Each country was therefore already growing rapidly from natural increase, the excess of births over deaths and net migration added substantially to this, doubling, tripling, or even quadrupling the growth rate from what it would have been otherwise (figure V.15).

Unlike high positive net migration rates, high negative rates tend to be isolated episodes rather than being sustained over decades. The second most negative rate in any quinquennium, in fact, was in Kuwait in 1990-1995, when annual net migration was –6.2 per cent as a result of invasion. The most negative was in Equatorial Guinea in 1970-1975 (–7.0 per cent), when a brutal regime took over after independence and population fell by a quarter in five years. In Kuwait, of course, demographic recovery was fairly quick and in Equatorial Guinea, migrant flow turned strongly positive in 1980-1985. The next three most negative net migration rates were in countries already considered—Rwanda, Bosnia and Herzegovina and Afghanistan—where large negative rates did not persist either.

Figure V.15. Net migration rate and rate of natural increase in four countries with the highest net migration rates, 1950-2005



Sustained strongly negative net migration rates are rooted not in the types of crisis situations that affected these countries but in conditions that appear to be more common in small island states. Six of the nine countries with average net migration rates of –1.0 per cent annually or lower were island states of fewer than 200,000 people in 2005: Tonga and Samoa, in Polynesia; Grenada, St. Vincent and the Grenadines and St. Lucia in the Caribbean; and São Tomé and Príncipe, off the west coast of Africa. The others among the nine countries were Guyana, Surinam and Jamaica, by far the largest of these nine with a population of 2.7 million in 2005. Each one of these nine countries, despite average net migration rates as low as –1.9 per cent annually from 1960 to 2005, still had growing populations.

These cases demonstrate a second type of impact of international migration: effectively reducing high population growth rates but not eliminating growth. This is further illustrated in table V.5 and figure V.16 for regions consisting mainly of island countries, to which most of these countries belong. The net migration rate did not come close to offsetting the rate of natural increase, though especially in Polynesia, it did take a bite out of it.

For these regions, the reduction in growth due to net emigration becomes no larger in the projections, given that net emigrants (as well as net immigrants) are hardly ever projected to increase (aside from near-term adjustments to allow for the return of refugees). The proportional effect of net migration could be greater, however, as the rate of natural increase falls. In Polynesia, in particular, natural increase falls from 1.9 per cent annually in 2000-2005 to 0.5 per cent annually in 2045-2050. Although the net migration rate also declines in the absolute, from -–0.8 per cent to –0.4 per cent, the latter figure comes closer to counterbalancing natural increase.

TABLE V.5. ANNUAL NET MIGRATION RATE AND RATE OF NATURAL INCREASE FOR DEVELOPMENT GROUPS, MAJOR WORLD AREAS AND REGIONS, SELECTED PERIODS *(per cent)*

Development group or major world area and region	*Net migration rate (per cent)*					*Natural increase (per cent)*				
	1975-1980	*1995-2000*	*2000-2005*	*2020-2025*	*2045-2050*	*1975-1980*	*1995-2000*	*2000-2005*	*2020-2025*	*2045-2050*
World	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1.76**	**1.37**	**1.24**	**0.88**	**0.36**
More developed regions	0.11	0.21	0.27	0.18	0.18	0.55	0.11	0.08	-0.10	-0.29
Less developed regions	-0.04	-0.05	-0.06	-0.03	-0.03	2.16	1.68	1.51	1.06	0.47
Least developed countries	-0.13	-0.06	-0.01	-0.03	-0.02	2.62	2.50	2.43	2.01	1.26
Other less developed countries	-0.02	-0.05	-0.07	-0.03	-0.03	2.10	1.55	1.36	0.87	0.25
Africa	**-0.04**	**-0.04**	**-0.05**	**-0.03**	**-0.02**	**2.87**	**2.48**	**2.37**	**1.88**	**1.19**
Eastern Africa	-0.10	0.09	-0.01	-0.01	-0.01	3.05	2.65	2.57	2.08	1.31
Middle Africa	0.00	-0.30	0.02	-0.01	-0.01	2.92	2.70	2.78	2.48	1.60
Northern Africa	-0.08	-0.17	-0.18	-0.07	-0.05	2.74	1.97	1.85	1.28	0.59
Southern Africa	0.01	0.15	0.02	0.01	0.01	2.49	1.68	1.08	0.44	0.20
Western Africa	0.04	-0.01	-0.05	-0.04	-0.03	2.84	2.77	2.62	1.98	1.26
Asia	**-0.02**	**-0.04**	**-0.04**	**-0.03**	**-0.02**	**1.95**	**1.45**	**1.26**	**0.81**	**0.20**
Eastern Asia	-0.01	-0.01	-0.02	-0.01	-0.01	1.43	0.86	0.64	0.28	-0.35
South-Central Asia	-0.04	-0.07	-0.06	-0.03	-0.03	2.39	1.91	1.70	1.12	0.46
South-Eastern Asia	-0.07	-0.03	-0.06	-0.05	-0.05	2.21	1.58	1.46	0.87	0.24
Western Asia	0.13	0.04	0.06	0.01	0.01	2.70	2.11	1.88	1.38	0.70
Europe	**0.05**	**0.13**	**0.22**	**0.11**	**0.12**	**0.44**	**-0.13**	**-0.15**	**-0.30**	**-0.48**
Eastern Europe	0.01	0.05	0.01	0.00	0.00	0.62	-0.41	-0.48	-0.62	-0.81
Northern Europe	0.03	0.13	0.30	0.19	0.19	0.16	0.12	0.13	0.13	-0.06
Southern Europe	0.11	0.23	0.56	0.18	0.18	0.68	0.04	0.06	-0.26	-0.46
Western Europe	0.07	0.17	0.25	0.18	0.18	0.08	0.09	0.09	-0.12	-0.32
Latin America and the Caribbean	**-0.14**	**-0.15**	**-0.25**	**-0.09**	**-0.08**	**2.43**	**1.71**	**1.55**	**0.93**	**0.28**
Caribbean	-0.42	-0.30	-0.28	-0.21	-0.19	1.89	1.38	1.24	0.85	0.23
Central America	-0.30	-0.29	-0.67	-0.19	-0.18	2.94	2.06	1.84	1.10	0.33
South America	-0.04	-0.09	-0.09	-0.03	-0.03	2.31	1.61	1.46	0.87	0.26
Northern America	**0.31**	**0.45**	**0.47**	**0.34**	**0.29**	**0.66**	**0.59**	**0.56**	**0.37**	**0.11**
Oceania	**0.23**	**0.27**	**0.39**	**0.25**	**0.21**	**1.19**	**1.13**	**1.04**	**0.71**	**0.27**
Australia/New Zealand	0.37	0.45	0.59	0.38	0.33	0.84	0.66	0.61	0.40	0.07
Melanesia	-0.17	-0.13	-0.10	-0.04	-0.03	2.41	2.55	2.30	1.47	0.73
Micronesia	-0.31	-0.96	-0.34	-0.19	-0.16	2.76	2.24	1.93	1.26	0.58
Polynesia	-1.24	-1.01	-0.83	-0.44	-0.38	2.58	2.13	1.85	1.24	0.46

The absolute number of net emigrants from these four island regions is small, so small that the numbers for Melanesia, Micronesia and Polynesia could not be depicted in figure V.12. Where the absolute numbers are larger, populations are also much larger and net migration tends to do less to offset natural increase. In China and India, two of the four countries that have had the largest number of net emigrants, they have never equalled more than 4 per cent of natural increase (figure V.17). In the Philippines they have run at 10-11 per cent since 1980. In Mexico, in 2000-2005, it has reached 47 per cent, an unusually high percentage but still well short of counteracting growth from the balance of births and deaths. Such a point will not come for Mexico in the projections until natural increase has practically petered out in 2045-2050, given that the most recent spike in emigrants is not taken to herald future increases and is projected to recede. In the Philippines, a point where net emigrants entirely counterbalance natural increase is not reached at all in the projections.

Figure V.16. Net migration rate and rate of natural increase in regions that encompass mainly island countries, 1950-2005

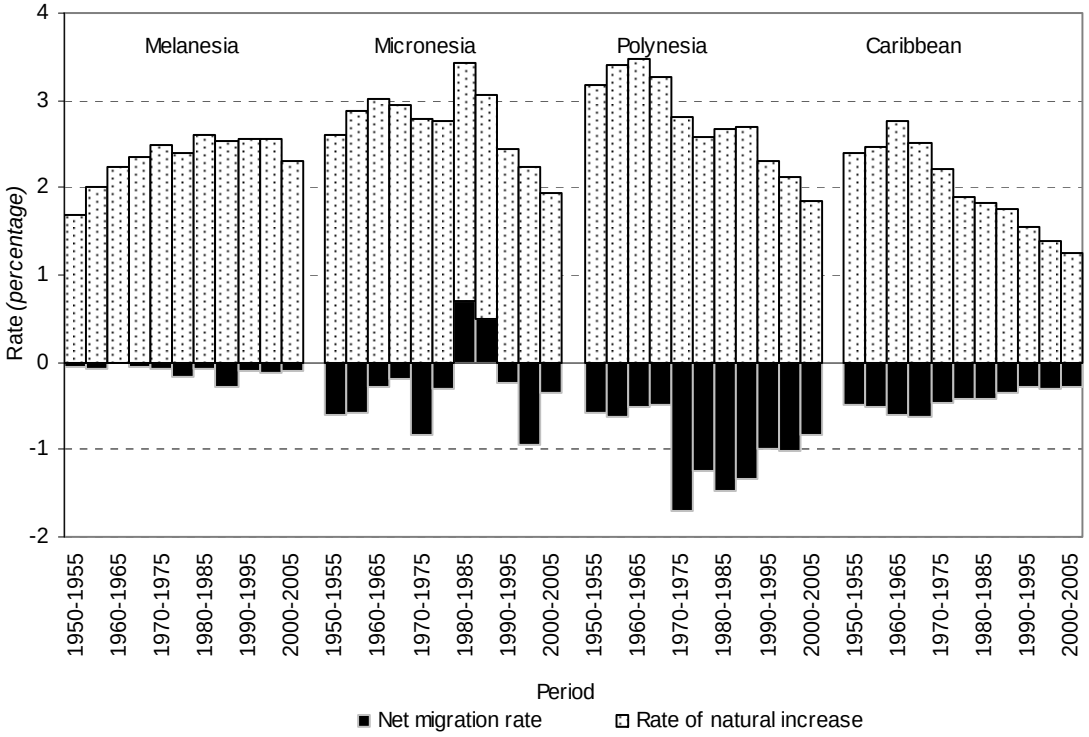
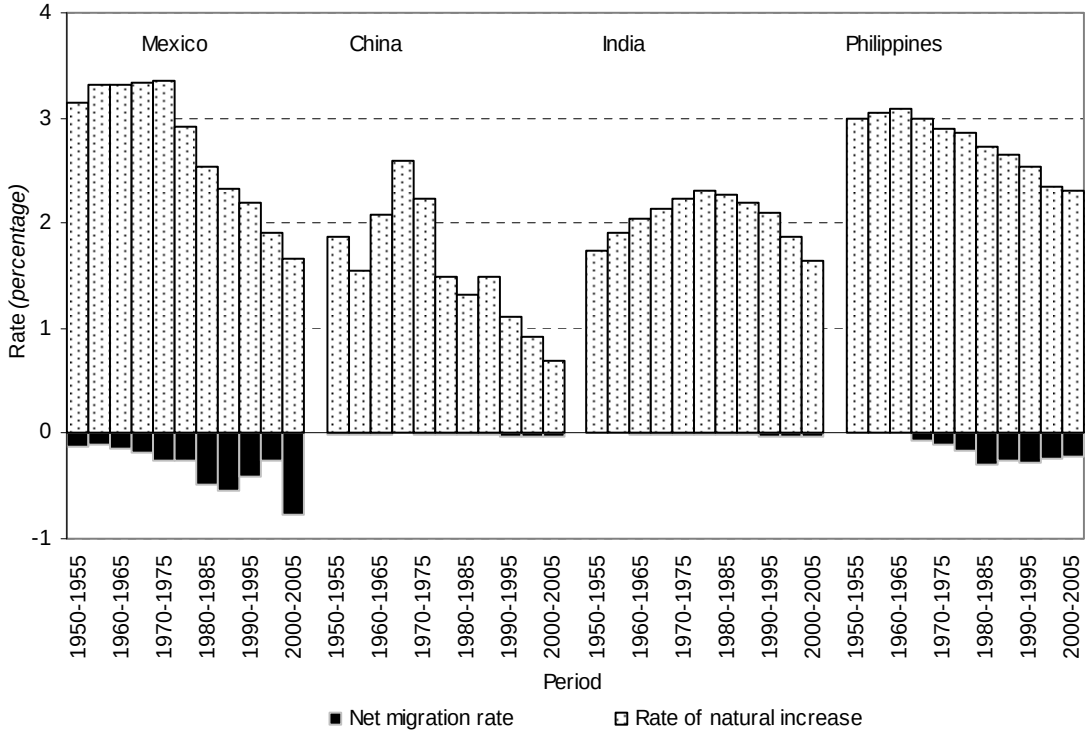


Figure V.17. Net migration rate and rate of natural increase in four countries with the most net emigrants, 1950-2005



Neither a large addition to population growth from migration nor a large reduction is common in less developed regions. In the least developed countries as well as in other less developed countries, migration tends instead to have a small negative effect on population growth, a situation that is projected to stay largely unchanged (figure V.18).

2. More developed regions

As a group, more developed regions show a different pattern, where weak natural increase or actual decreases may be partly offset by migration. Net migration rates have risen for more developed regions from 0.05 per cent annually in 1960-1965 to 0.27 per cent in 2000-2005 as seen in table V.5. Though even the latter rate is quite low, it is high enough to be more than triple the rate of natural increase in the period. Natural increase will continue to decline and migration will become the only basis for population growth as soon as 2015. This description mainly reflects the situation in Europe. In Northern America and Australia/New Zealand, natural increase is projected to stay positive through mid-century (figure V.19). Even in these two regions, however, the net migration rate should exceed the rate of natural increase by 2025.

Two of the four European regions also do not quite conform to the overall pattern for more developed regions (figure V.20). Eastern Europe has not only the most negative rate of natural increase but also a net migration rate close to zero and is projected to stay that way. At the other extreme, Northern Europe will have positive natural increase up to 2035 and net migration beyond that point should be sufficient to maintain positive population growth to mid-century.

Figure V.18. Net migration rate and rate of natural increase for development groups, 1950-2050

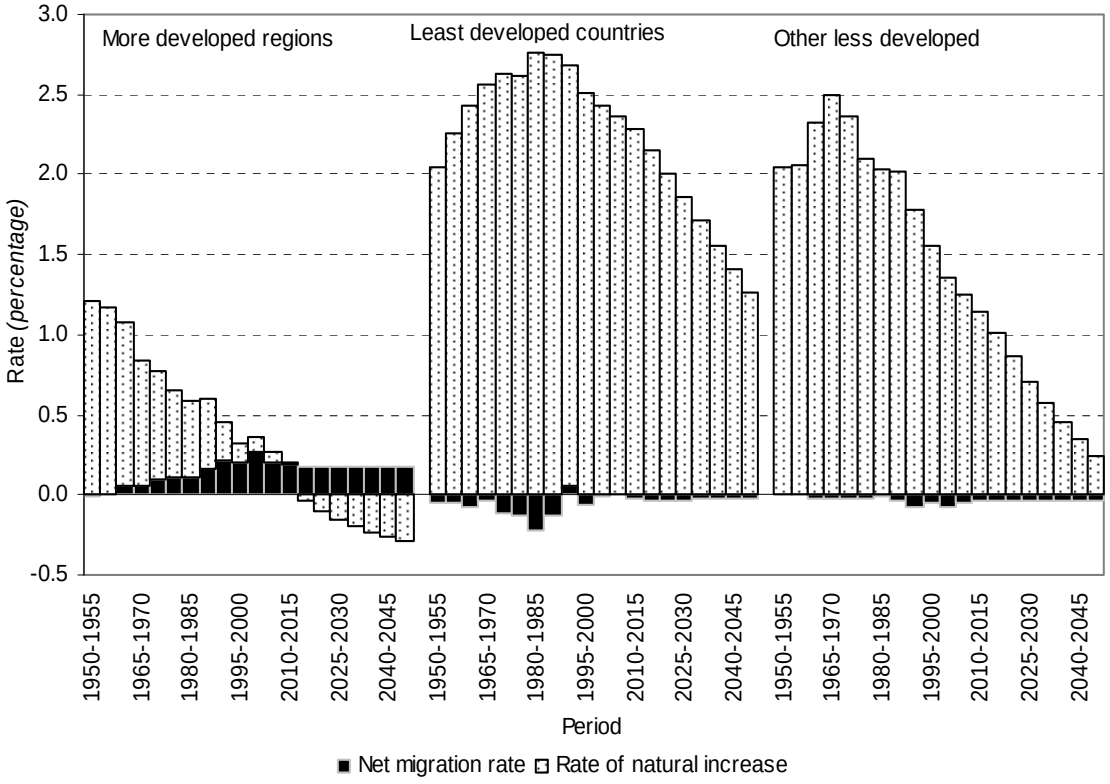


Figure V.19. Net migration rate and rate of natural increase for Europe, Northern America, and Australia/New Zealand, 1950-2050

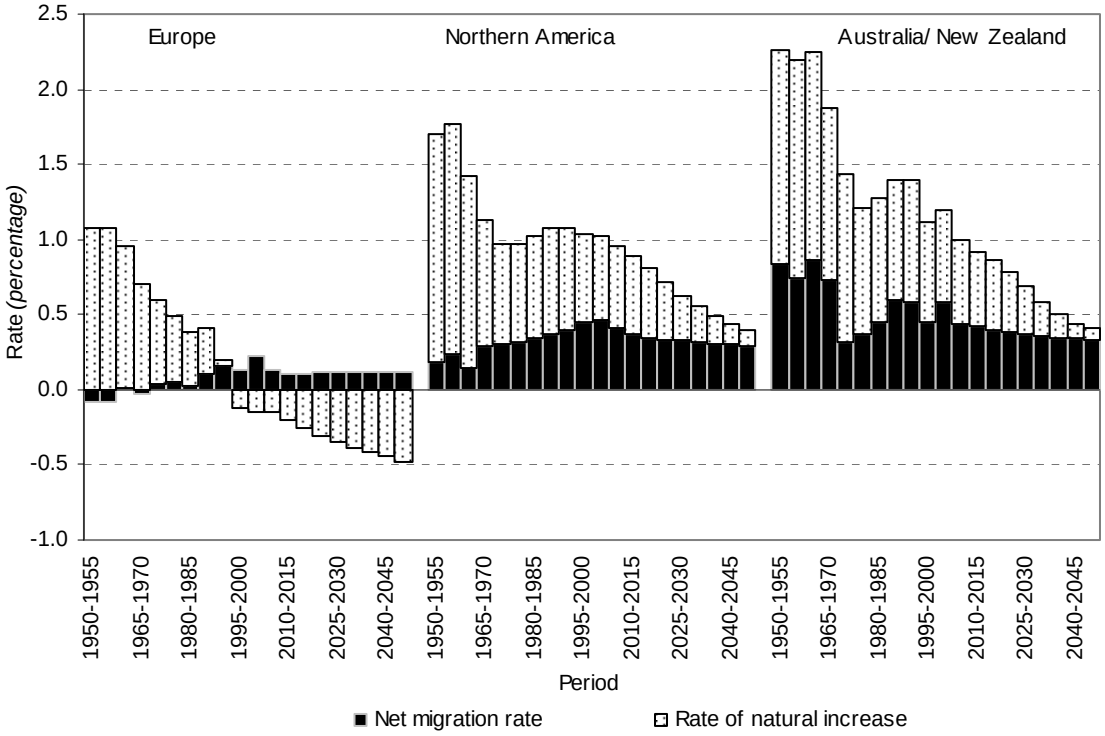
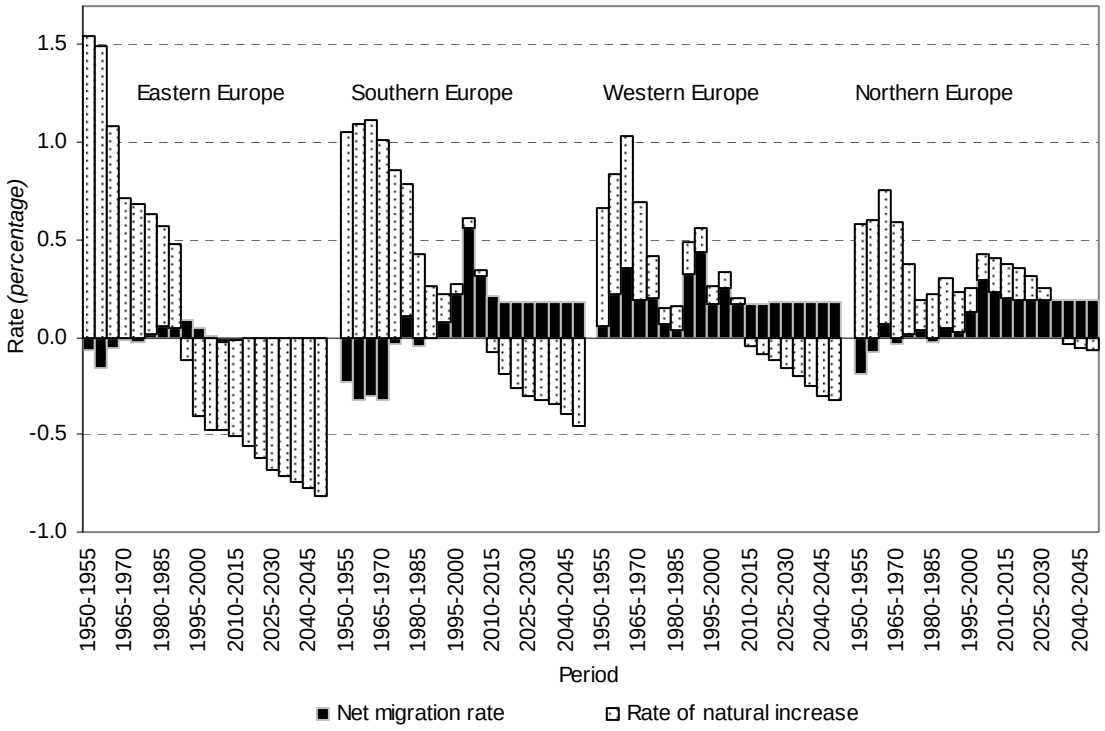


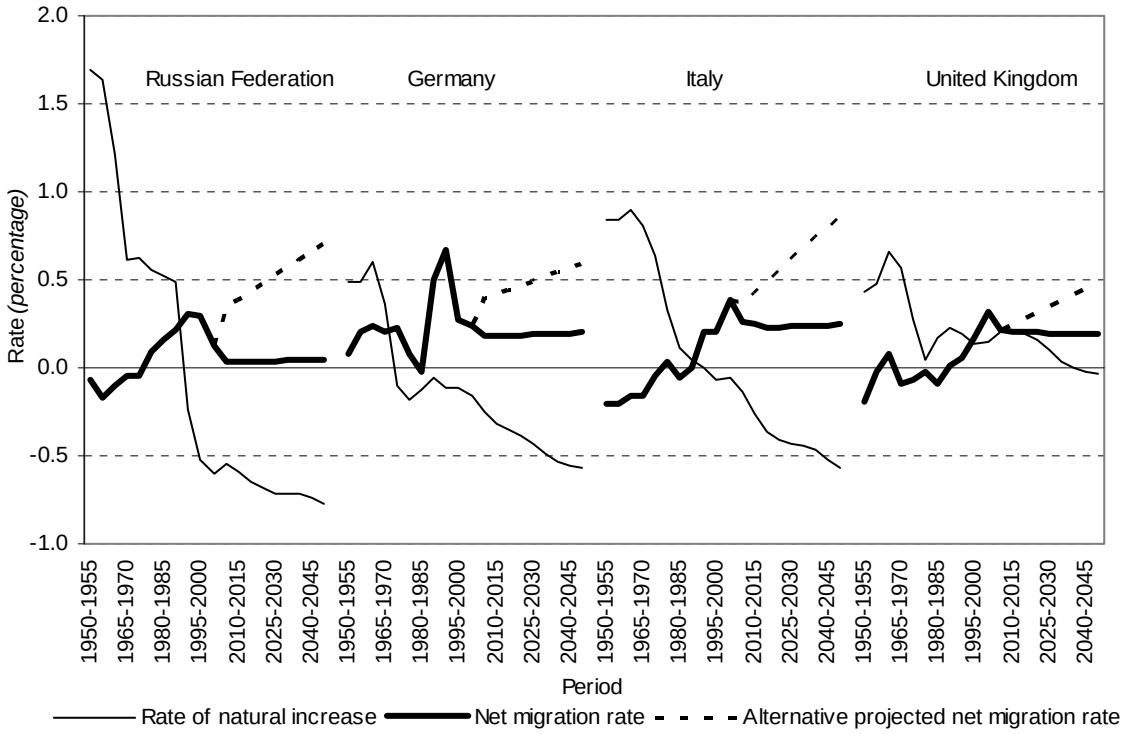
Figure V.20. Net migration rate and rate of natural increase for European regions, 1950-2050



The projections assume that future numbers of migrants will stay constant around current levels, regardless of any apparent trend. Could negative population growth in Europe be avoided if upward trends in migrants were taken into account? A crude approach to this question is taken by considering the largest country in each European region. Trends in the net migration rate in these countries are similar to those for their respective regions in the previous figure. If whatever trend existed in the net migration rate from 1960 to 2005 is simply extrapolated linearly, the rate would rise to mid-century in each of these four countries, most sharply in Italy but also in Germany, the Russian Federation and the United Kingdom (figure V.21). Germany and Italy would then avoid negative population growth, which would otherwise start almost immediately, at least until mid-century. The United Kingdom is not projected to have negative population growth; extrapolating the trend would enhance the growth. Only in the Russian Federation would negative population growth continue, though to a substantially smaller degree.

A continuing upward trend in immigration for most European countries simultaneously may be somewhat unlikely. However, such a trend for specific countries, with many migrants moving within the continent, cannot be excluded. The numbers that would be required for such trends are substantial. In Germany, for instance, 150,000 net immigrants annually from 2005 onward are assumed in the medium projection. A continuing upward trend implies that numbers would be about double this initially and close to triple this by 2050. For Italy, the numbers would be quite similar, though initially the increase over the medium projection would be smaller.

Figure V.21. Net migration rate and rate of natural increase, with alternative projection for migration, for the largest countries in each European region, 1950-2050



3. The impact of international migration

Even without trends being extrapolated in this fashion, migration can have a substantial impact on long-term prospects for individual countries. This can be shown by contrasting the medium projection with a projection that assumes no international migration for any country from 2005. World population would be barely affected and then only because migrants are generally assumed to adopt demographic characteristics of the population of the receiving countries. But the populations of specific regions and countries could be quite different (table V.6). Eight out of the 21 regions would see populations changes to 2050 at least 10 percentage points higher or lower than otherwise projected. The biggest difference would be for Polynesia, which could grow 70 per cent from 2005 to 2050 without migration rather than 32 percent. The difference would also be notable, in the opposite direction, for Northern America and Australia/New Zealand. Instead of growing by a third, population in each of these two regions would grow under 10 per cent.

Eliminating all migration would have more extreme results in a few countries. In ten countries, percentage growth in 2005-2050 would be higher or lower by at least 50 percentage points. The population of Guyana, for instance, would grow by a third instead of declining by a third. The population of Tonga would double instead of increasing by only a fourth. These two and the other eight countries are all small countries; for some larger countries such as Canada, Mexico, Sri Lanka and the United States, migrants make a difference of roughly 20-35 percentage points in population increase to 2050.

At the world level, migrants have a more subtle impact than simply affecting population numbers. Patterns of migrant flow hint at the possibility that the densest countries are leaking migrants at the same time that the relatively open spaces that are left have become less attractive. To illustrate this, countries were divided into three classes by population density: low density countries with fewer than 25 persons per sq. km., intermediate density countries with 25-99 persons per sq. km. and high density countries with 100 persons per sq. km. or more. In 1950-1955, the low density countries received net migrants from the other two classes, the majority from intermediate density countries (figure V.22). This situation persisted until 1975. From that point, an increasing number of net cross-class migrants began to come from the high density countries, which were losing them more often to intermediate density countries. The low density countries are receiving proportionally fewer net migrants.

However, the pattern has been somewhat erratic over two or three decades. In addition, net cross-class migrants, who are shown in the figure, tend to be substantially outnumbered by net migrants who move between the three density classes or are offset by net migrants in the reverse direction. In recent decades, such migrants have been about three times as numerous as those who represent a gain or loss for a density class.

Migrants also impact global resources in other ways. Annual usage of electricity around the world is approximately 2,500 kilowatt hours (kWh) per capita.[5] Consumption is much higher in more developed regions than in the other less developed countries or the least developed countries (figure V.23). Migrant per capita consumption depends on whether one considers their countries or origin or destination. In their countries of origin, average consumption, weighted by net emigrant numbers in 2000-2005, was 1,300 kWh per capita. In their countries of destination, the similarly weighted average was 8 600 kWh per capita, almost equal to the overall average for more developed regions. Therefore, if migrants adopt consumption patterns in their destination countries, on average their electricity use is multiplied seven times.

From the migrants' perspective, greater consumption (and not just of electricity) is often in fact what they seek. The gains are not theirs alone but may also extend to their origin

[5] This is estimated from United Nations (2007b) Statistical Division data on total consumption, related to population by country and averaged over the period 2000-2004. A few countries were missing data. In three cases—Botswana, Namibia and the Republic of Korea—these gaps were filled with 2005 estimates from the International Energy Agency (2007), which generally gives comparable estimates.

TABLE V.6. PERCENTAGE INCREASE IN POPULATION IN THE MEDIUM VARIANT PROJECTION AND A VARIANT WITH NO MIGRATION AFTER 2005, FOR THE WORLD, DEVELOPMENT GROUPS AND SELECTED REGIONS AND COUNTRIES WITH THE GREATEST DIFFERENCE BETWEEN THE VARIANTS, 2005-2025 AND 2005-2050

(per cent)

Development group, region, or country	*2005-2025*			*2005-2050*		
	Medium projection	*No migration*	*Difference*	*Medium projection*	*No migration*	*Difference*
World	23	23	0	41	41	0
More developed regions	4	-1	-5	2	-10	-12
Less developed regions	27	28	1	50	53	3
Least developed countries	55	55	1	127	129	2
Other less developed countries	23	24	1	37	40	3
Selected regions						
Australia/New Zealand	19	9	-11	36	9	-27
Northern America	18	8	-10	34	8	-26
Northern Europe	8	2	-5	12	-2	-14
Western Europe	2	-2	-4	1	-11	-12
Southern Europe	2	-3	-5	-3	-14	-12
Micronesia	27	34	7	50	61	11
Caribbean	16	23	7	24	40	16
Central America	25	32	7	41	57	16
Polynesia	20	36	16	32	71	39
Selected countries						
United Arab Emirates	53	24	-29	108	31	-77
Luxembourg	25	2	-23	58	-4	-62
Kuwait	48	25	-23	94	35	-60
Western Sahara	76	33	-43	113	57	-56
China, Hong Kong SAR	18	-1	-19	27	-19	-47
Qatar	38	22	-17	67	26	-42
Jamaica	8	27	18	3	47	44
U.S. Virgin Islands	-4	14	18	-26	19	46
Fiji	9	30	21	10	56	46
Suriname	7	25	18	-6	43	48
St. Vincent and the Grenadines	5	27	22	-11	46	56
Grenada	2	26	23	-10	47	57
Micronesia (Fed. States of)	14	46	33	22	88	66
Guyana	-8	22	29	-35	36	72
Tonga	12	48	36	23	104	81
Samoa	15	46	31	17	100	83

countries, in the form of improvements in human capital, should they return; cultural influences, at least some of which should be beneficial; and particularly remittances. Net remittances to less developed regions have reached substantial proportions. In 2000, recorded net remittances were US$73.0 billion; by 2005, they had more than doubled to US$155.2 billion (Ratha and Xu 2007). This does not count substantial unrecorded flows, whether through formal or informal channels. Recorded inflows for less developed regions in 2007 were twice as large as all official development assistance. Not surprisingly, the four countries receiving the largest recorded total remittances in2007 were also the four with the greatest numbers of net emigrants from 1975 to 2005 (see figure V.8), though not in the same order. The largest inflows went to India, followed by China, Mexico and the Philippines (Ratha, Mohapatra, Vijayalakshmi and Xu 2007).

Figure V.22. Net migrants across three classes of countries by population density, 1950-2005

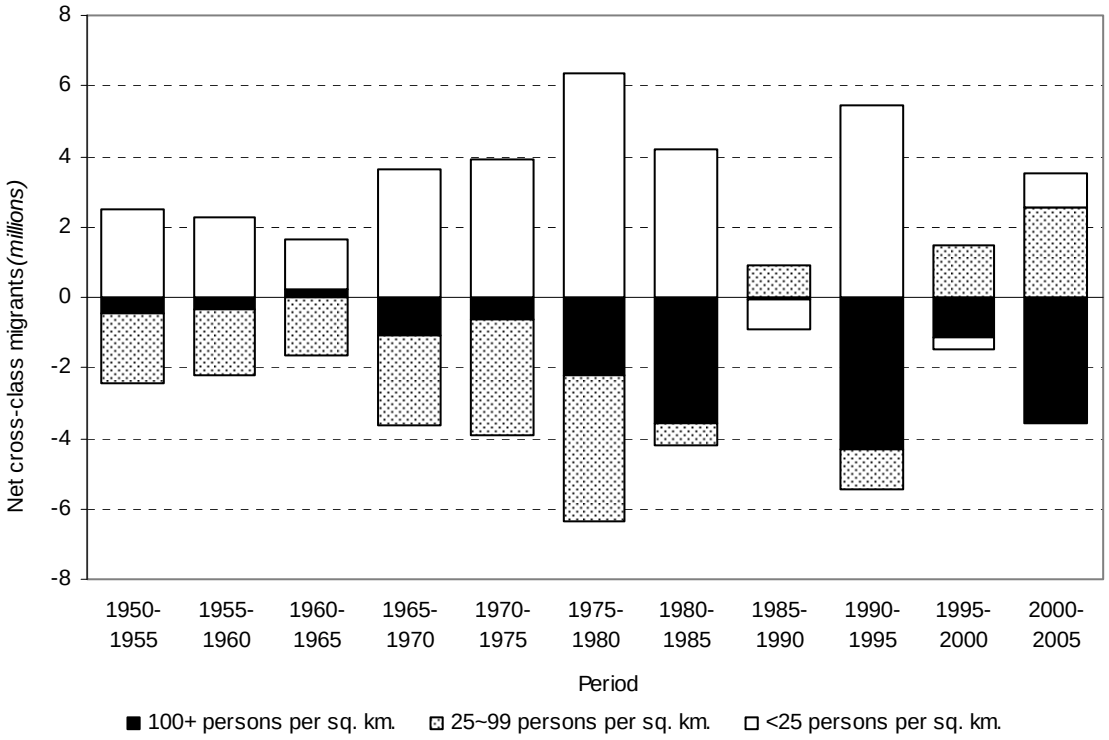
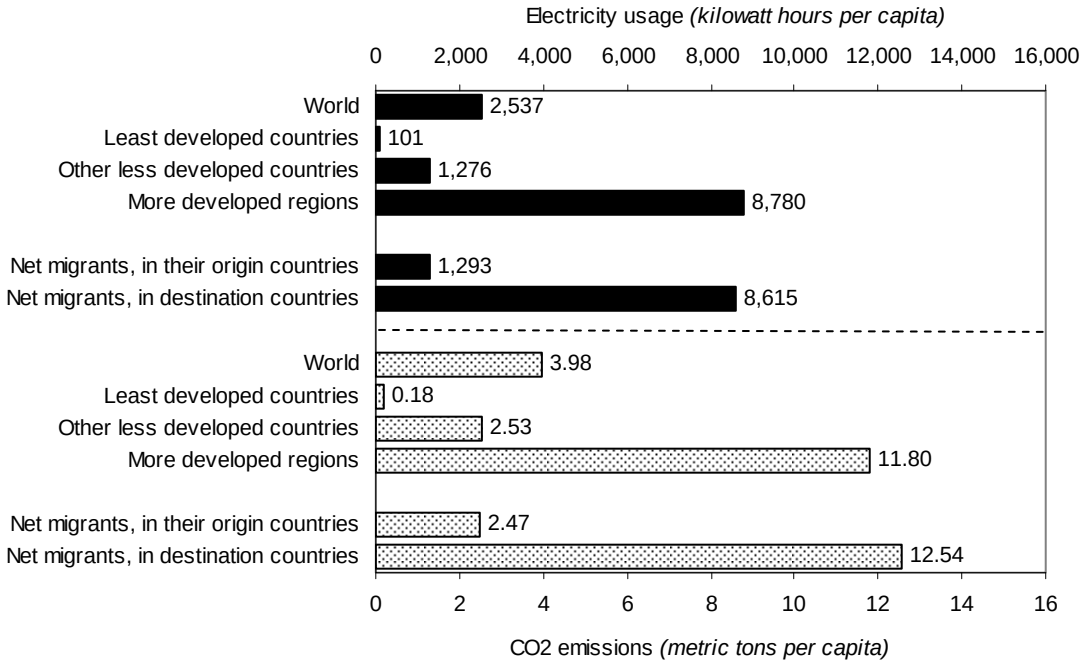


Figure V.23. Annual electricity usage and CO2 emissions per capita, for the world, development groups and net migrants, 2000-2005



Migration is not without its costs. Figure V.25 also shows emissions of carbon dioxide.[6] When migrants adopt consumption styles in their destination countries, their CO_2 emissions on average become five times as high as before migrating—12.5 metric tons per capita instead of 2.5. This is a slightly greater disparity than that between the average inhabitants of more developed regions and other less developed countries.

Because net migrants in any year are relatively few—only 4.8 million annually in 2000-2005, out of a world population of 6.5 billion by 2005—their aggregate impact is small, though disproportionate to their numbers. (Other inter- national migrants, besides net migrants, are essentially replaced by others moving in the opposite direction, so their impact cancels out). In the long term, migrants should have some impact, though how much depends on how national consumption patterns change. On the default assumption that patterns do not change, or at least that change in destination countries is proportional to change in origin countries, projected future migration would raise electricity use slightly, by 4 percent by 2025 and by 10 percent by 2050. This is estimated by comparing electricity consumption given current patterns under the medium projection and under a projection variant with no migration from 2005. National consumption patterns will of course change. If they diverge across countries, the impact of migration would be greater. If they converge, the impact of migration would be less. However, convergence will probably entail lower-consumption countries catching up with the higher-consumption ones, so the overall impact on the planet would be greater.

The demographic history of the last half century is a record of human striving for longer lives, prized children and preferred abodes. It reflects people's success, but also their setbacks, as epidemics threaten health and life, as conflicts displace large numbers. It reflects the rise of new personal goals and ways of life, as more and more people gradually temper their desire for large families. The striving to live, relocate and reproduce continues in projections for the next half century, but in a more muted fashion. Large families continue to be phased out, though slowly and unevenly. Movements to preferred locations for living do not lessen, but no longer increase rapidly. People live increasingly long lives, though their gains may not match those of their parents. And yet, as the world population greys, it continues to grow, by 40 percent by mid-century. The 9.2 billion people by then will have remade the world.

[6] Obtained from United Nations (2007b) Statistical Division data averaged over 2000-2004.

VI. METHODOLOGY OF THE UNITED NATIONS POPULATION ESTIMATES AND PROJECTIONS

The preparation of each new *Revision* of the official population estimates and projections of the United Nations is a complex process involving several steps.

First, based on new empirical evidence and informed by recent findings in demography, sociology, political sciences and economics, specific guidelines about dominant future trends of fertility, mortality and migration are formulated. These guidelines ensure consistency between and comparability of the estimated and projected demographic trends for the world's countries. These guidelines are flexible and allow for the incorporation of country-specific trends that deviate from assumed general trends and they take into account a countries current position in the demographic transition from high to low fertility and mortality. Specific guidelines for fertility, mortality and migration are described in the main body of this chapter.

The population estimates and projections of this *Revision* cover 100 years, from mid-year 1950 to mid-year 2050. The 100 years covered in this *Revision* are subdivided into past estimates (1950-2005) and projections (2005-2050). Past estimates of demographic variables are either directly taken from national statistical sources, or estimated by the Population Division based on the best available national or international estimates, and if needed, adjusted for deficiencies such as age misreporting, under-enumeration of populations or underreporting of vital events, such as birth and deaths. Adjustments are also made to international migration. The year 2005, separating the past estimates from the projections, is called the base year of the projections (sometimes the terms start year or jump-off year can be found). The projection period of this *Revision* covers 45 years and ends in 2050. Usually, population projections prepared by the United Nations Population Division are carried out for a number of variants and scenarios, all based on the medium variant.

The preparation of each new *Revision* of the official estimates and projections of the United Nations involves two distinct processes: (*a*) the incorporation of all new and relevant information regarding the past dynamics of the population of each country of the world, and (*b*) the formulation of detailed assumptions about the future paths of fertility, mortality and international migration. In order to ensure consistency and comparability, certain steps must be taken. New information is evaluated to determine recent changes in population dynamics that have an impact on the age and sex structure of the population at the base year (the year when the projection starts). The methods used to carry out this evaluation must be technically appropriate and consistently applied. With respect to the projection period, general guidelines are established regarding the paths that fertility, mortality and international migration are to follow in the future. However country-specific deviations from the general guidelines are common under two sets of circumstances: (*a*) when recent trends suggest that the population of a country is not yet ready to embark on the path determined by the general guidelines, a transition period between current dynamics and those formulated in the general guidelines has to be introduced, and (*b*) when the populations of certain countries are likely to experience a long-term deviation from the paths set by the guidelines, as is the case for countries where the prevalence of HIV/AIDS is high.

This chapter first describes the way past estimates were revised during the preparation of the *2006 Revision* of the United Nations population projections. It then examines the assumptions made and approaches used for projecting fertility, mortality and international migration up the year 2050. Finally, procedures and assumptions for population projections are described. This chapter also provides the technical documentation of models used for this *Revision* in an annex.

A. PAST ESTIMATES OF POPULATION DYNAMICS

One of the major tasks in revising the estimates and projections of the population of each country

of the world is to obtain and evaluate the most recent information available on each of the three major components of population change: fertility, mortality and international migration. In addition, newly available census information or other data providing information on the age distribution of the population are also carefully evaluated. The process of updating and revising past population estimates usually entails not only the separate evaluation of the quality of the different estimates available but also and more importantly the search for consistency among them. The key task is therefore to ensure that for each country past trends of fertility, mortality and international migration are consistent with changes in the size of the population and its distribution by age and sex. In very general terms, for most countries in the more developed regions, the availability of detailed information on fertility and mortality trends over time and of periodic censuses of the population greatly facilitates the task of producing reliable estimates of past population dynamics. Yet, even for those countries, the data on international migration flows are generally inadequate. Consequently, consistency between population counts and the components of population change is often achieved by assigning to net international migration the residual estimate obtained by comparing actual intercensal population growth with independent estimates of natural increase.

For many countries in the less developed regions, the estimation of past trends is more complex. In these countries, information may be limited or lacking and the available data may be unreliable. In numerous cases, therefore, consistency can only be achieved by making use of models in conjunction with methods of indirect estimation (United Nations, 1983, 2002). In extreme cases, when countries have no data referring to the past decade or two, estimates are derived by inferring levels and trends from those experienced by countries in the same region that have a socio-economic profile similar to the country in question. However, since the 1970s the emphasis put on surveys and census-taking in the developing countries has considerably improved the availability of demographic information.

At the global level, data from censuses or reliable official estimates based on censuses, population registers and surveys referring to 1995 or later were available for 201 countries, 87 per cent of the 229 countries or areas for which projections are carried out. For 17 countries, data were available from the 1985-1994 global censuses round, for 11 countries (Somalia, Afghanistan, Suriname, Serbia, Togo, Myanmar, Djibouti, Eritrea, Congo, Liberia, Democratic Republic of the Congo), census information or estimates with comparable quality were available from the global 1975-1984 census round, and for 1 countries (Angola), data were available only for years before 1975.

Aside from relying on census information concerning the distribution of the population by age and sex, in order to estimate the population as of 1 July 2005, the base year, trends in fertility, mortality and international migration up to this date must be established. Ideally, complete time series of annual age-specific fertility rates, life tables and age-specific net international migration rates by sex would be needed. In practice, the information available is considerably less comprehensive, consisting often of no more than the average age-specific fertility rates experienced by women over one or two periods of various lengths, estimates of infant or child mortality at several points in time and, less commonly, one or two life tables for different periods. For developing countries, estimates of recent fertility and child mortality are often derived from surveys, especially when countries lack a civil registration system or have one that does not have sufficient coverage of all vital events. When countries have a reliable civil registration system, as is the case in most developed countries and in some developing countries, data on both fertility and mortality by age and sex are theoretically available on a continuous basis. However, owing to either delays in processing the data or the difficulty of estimating appropriate denominators to calculate age-specific fertility or mortality rates, fertility schedules and life tables may only be available for selected years. In preparing the revised estimates of the base-year population, such information has to be taken into account to-

gether with trends in other indicators, such as changes in the overall number of births.

To provide some assessment of the timeliness of the information on which the *2006 Revision* is based, tables VI.1a, b and c present the distribution of countries by region and time period, indicating the most recent information used for estimating fertility, child mortality and adult mortality. Such information pertains to a total of 195 countries, each of which was estimated to have a population of 100,000 inhabitants or more in 2007.

As table VI.1a indicates, this *Revision* incorporates relatively recent information on fertility for most countries: out of the 195 countries considered, 188 had information referring to 1995 or later. Only four countries had information before 1990 on fertility (Equatorial Guinea, Liberia, Burundi, and Guyana). All countries in Europe, Northern America and Oceania had information referring to 1995 or later, whereas in the developing regions the percentage of countries with recent information was lower, varying from a high of 99 per cent in Asia, to 98 per cent in Latin America and the Caribbean, and to a low of 89 per cent in Africa.

Child mortality, e.g. the probability to survive from birth to age five, is a lead indicator to assess the welfare of children. The availability of information on it was also high (table VI.1b), with 192 countries having information referring to 1995 or later, including all of the developed countries. At the regional level, only one country in Africa (Western Sahara) had no information on childhood mortality while one African country (Liberia) and one country in Latin America and the Caribbean (Saint Vincent and the Grenadines) had data referring to dates prior to 1995. This implies that for 99.9 per cent of the world population information from 1995 and later was used in the estimation of child mortality.

In contrast with the availability of information on fertility and on mortality in childhood, information on adult mortality was sparse and often outdated (table VI.1c). Data on adult mortality referring to 1995 or later was used in less than half of all countries considered (46 per cent) and no empirical data on age specific mortality was available for the estimation of adult mortality in 44 per cent of the countries. Information was especially lacking or of insufficient quality among the countries of Africa (95 per cent) and Asia (13 per cent). However, it is important to underline that life expectancy estimates are often derived from more recent information than what is documented in table VI.1c with respect to adult mortality. In particular, life expectancy at birth was often arrived at by using recent information of infant and child mortality and appropriate model life tables. In addition, official estimates of adult mortality were sometimes considered, but not necessarily used because their quality was not adequate or due to methodological constraints (e.g. implementation of the AIDS methodology and actual base year of the projection). Thus, table VI.1c reflects the data that was used in this *Revision*, not the availability of the data.

It is important to consider the implications of data availability for the quality of the population estimates and projections made. One way of assessing the probable overall impact of the uncertainty involved in making estimates on the basis of non-existent or outdated information is to calculate the proportion of the population to which the less reliable or outdated estimates refer. With regard to information on child mortality, the total population of countries lacking recent information was, with fewer than 3 million people, very small. As for fertility, the population of countries that either lacked data entirely or whose most recently used estimates referred to periods before 1995 amounted to less than 3 per cent of the world population. However, the proportion of the population lacking equally recent estimates of adult mortality amounted to 54 per cent. Therefore, the most serious weakness faced in producing the 2005 base year estimates of the population of each country was the lack of recent information on mortality and especially on adult mortality. Owing to the wide availability of data from recent census enumerations, the lack of recent mortality data would be less critical if those enumerations were accurate. However, considerable evidence exists that coverage errors in census enumerations are not necessarily small. Furthermore, as an increasing number of countries face sharp rises in mortality brought about by war, civil strife, major social and economic changes, or the HIV/AIDS epidemic, direct information on

TABLE VI.1a. DISTRIBUTION OF COUNTRIES AND THE POPULATION ACCORDING TO THE MOST RECENT DATA USED FOR THE ESTIMATIONS OF FERTILITY

Topic and reference date	*Africa*	*Asia*	*Europe and Northern America*	*Latin America and the Caribbean*	*Oceania*	*Total*
			Number of countries			
No Information	—	—	—	—	—	—
Before 1985	1	—	—	1	—	2
1985-1989	2	—	—	—	—	2
1990-1994	—	1	—	2	—	3
1995-1999	8	1	1	2	3	15
2000 or later	43	48	41	30	9	173
TOTAL	54	50	42	35	12	195
			Population (millions)			
No Information	—	—	—	—	—	—
Before 1985	0	—	—	0	—	0
1985-1989	11	—	—	—	—	11
1990-1994	—	24	—	1	—	24
1995-1999	94	4	0	8	2	108
2000 or later	816	3 910	1 063	548	32	6 369
TOTAL	922	3 938	1 063	557	34	6 514
			Percentage of the population			
No Information	—	—	—	—	—	—
Before 1985	0.0	—	—	0.0	—	0.0
1985-1989	1.2	—	—	—	—	0.2
1990-1994	—	0.6	—	0.2	—	0.4
1995-1999	10.2	0.1	0.0	1.5	4.6	1.7
2000 or later	88.5	99.3	100.0	98.4	95.4	97.8
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

those trends is necessary to derive appropriate estimates of their impact on the population's age and sex structure. In the absence of direct and reliable information on the timing and magnitudes of such 'shocks' to mortality, estimations and approximations are necessarily less accurate.

A final consideration in the *Revision* of past estimates of population dynamics concerns the sources of information regarding international migration. In preparing this *Revision,* particular attention was given to official estimates of net international migration or its components (immigration and emigration), to information on labour migration or on international migration flows recorded by receiving countries, to estimates of undocumented or irregular migration by origin, and to data about refugee flows and stocks prepared by the Office of the United Nations High Commissioner for Refugees. Even by combining these numerous data sources, it is difficult to produce comprehensive and consistent data of net migration over time. In those cases net international migration was estimated as the residual not accounted for by natural increase between two successive enumerations of the population. Clearly, therefore, the paucity of reliable and comprehensive data on international migration should also be singled out as one of the limitations in producing more accurate estimates of the population for the base year.

TABLE VI.1b. DISTRIBUTION OF COUNTRIES AND THE POPULATION ACCORDING TO THE MOST RECENT DATA USED FOR THE ESTIMATION OF CHILD MORTALITY

Topic and reference date	*Africa*	*Asia*	*Europe and Northern America*	*Latin America and the Caribbean*	*Oceania*	*Total*
			Number of countries			
No Information	1	—	—	—	—	1
Before 1985	—	—	—	—	—	—
1985-1989	1	—	—	—	—	1
1990-1994	—	—	—	1	—	1
1995-1999	8	4	1	4	5	22
2000 or later	44	46	41	30	7	170
TOTAL	54	50	42	35	12	195
			Population (millions)			
No Information	0	—	—	—	—	0
Before 1985	—	—	—	—	—	—
1985-1989	3	—	—	—	—	3
1990-1994	—	—	—	0	—	0
1995-1999	81	81	0	9	2	173
2000 or later	837	3 857	1 063	549	31	6 336
TOTAL	922	3 938	1 063	557	33	6 514
			Percentage of the population			
No Information	0.0	—	—	—	—	0.0
Before 1985	—	—	—	—	—	—
1985-1989	0.4	—	—	—	—	0.1
1990-1994	—	—	—	0.0	—	0.0
1995-1999	8.8	2.1	0.0	1.6	5.4	2.7
2000 or later	90.8	97.9	100.0	98.4	94.6	97.2
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

B. THE PROJECTION OF FERTILITY

This section provides a detailed account of how future levels and age patterns of fertility were projected for countries in different groups of current fertility levels. In the discussion that follows, assumptions and methodology will be described in terms of the following groups of countries:

- High- and medium-fertility countries. High fertility countries are countries that until 2005 had no fertility reduction or only an incipient decline, and medium-fertility countries are those where fertility has been declining but whose level was still above 2.1 children per woman in 2000-2005;
- Low-fertility countries: Countries with total fertility at or below 2.1 children per woman in 2000-2005.

The projection of fertility in this *Revision* follows the methodology that was first introduced in the *2002 Revision*, with only minor changes. In this *Revision*, as in the previous one, it is assumed that countries in the transition from high to low fertility will ultimately approach a fertility floor of 1.85 children per woman, regardless of their current position in the fertility transition. The transition from the current level of fertility to the fertility floor is expressed by models of fertility change over time. These models have been formalized since the *2004 Revision*; they are described below and documented in the annex of this chapter. For countries currently below replacement level it is assumed that the fertility recovery will follow a uniform pace. As a consequence, individual countries will reach the fertility floor of 1.85 children per woman at different years in the future and not necessarily at the end of the projection horizon between 2045 and 2050.

TABLE VI.1c. DISTRIBUTION OF COUNTRIES AND THE POPULATION ACCORDING TO THE MOST RECENT DATA USED FOR THE ESTIMATION OF ADULT MORTALITY

Topic and reference date	*Africa*	*Asia*	*Europe and Northern America*	*Latin America and the Caribbean*	*Oceania*	*Total*
			Number of countries			
No Information	49	17	—	7	4	79
Before 1985	1	1	—	3	1	6
1985-1989	1	2	1	2	—	6
1990-1994	1	8	6	9	1	25
1995-1999	1	9	15	2	5	32
2000 or later	1	13	20	12	1	47
TOTAL	54	50	42	35	12	195
			Population (millions)			
No Information	870	519	—	40	1	1 430
Before 1985	1	25	—	10	0	37
1985-1989	33	85	4	7	—	129
1990-1994	9	1 461	316	157	0	1 943
1995-1999	8	230	336	48	28	650
2000 or later	1	1 619	407	294	4	2 325
TOTAL	922	3 938	1 063	557	33	6 514
			Percentage of the population			
No Information	94.4	13.2	—	7.2	1.8	21.9
Before 1985	0.1	0.6	—	1.9	1.4	0.6
1985-1989	3.5	2.2	0.4	1.3	—	2.0
1990-1994	1.0	37.1	29.7	28.2	0.5	29.8
1995-1999	0.9	5.8	31.7	8.7	83.8	10.0
2000 or later	0.1	41.1	38.2	52.7	12.5	35.7
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

1. The high- and medium-fertility countries

The projection of fertility for the high-fertility and medium-fertility countries is carried out through a unified model. First introduced in the *2002 Revision* (United Nations, 2004a, pp. 183-184), it is formulated in terms of the pace of fertility decline. An important feature of the fertility model is its assumption that fertility in all countries will eventually fall below replacement level, but not necessarily by the end of the projection period in 2050. In light of evidence that fertility in a growing number of countries in less-developed regions has already dropped below replacement level, or is rapidly approaching it, this *Revision* keeps the assumption of a fertility "floor" of 1.85 children per woman.

a. The pace of fertility decline

For all countries where fertility was above the replacement level in 2000-2005, fertility was projected in this *Revision* using a model based upon the combined experience of all countries that underwent fertility decline between 1950 and 2000.

The model relates changes in fertility over a specified period to the level of fertility at the beginning of that period. When examining the empirical evidence, a particular pattern emerges: decline in fertility is relatively slow when the fertility transition is starting but accelerates until fertility is between 4 and 5 children per woman. The pace of decline then decreases near the end of the transition. Further analysis of empirical pathways of fertility decline suggested some variations of the general pattern, associated with the pace or speed of fertility decline at the beginning and at the end of the fertility transition. Hence the models of fertility decline are labelled according their relative pace of decline at the beginning and at the end of fertility transition.

Three models have been identified to capture best the variety of pathways from high to low fertility. One model represents pathways with a slower decline at both high and low fertility, labelled "Slow/Slow". A second model exhibits faster decline at both high and low fertility levels and is labelled "Fast/Fast". Empirical evidence suggests a third model that combines a fast decline at high levels of fertility and slow decline as lower fertility levels are approached. The latter model is labelled "Fast/Slow". The three models of fertility decline have been implemented as logistic functions and are documented in the annex to this chapter (table VI.3).

The models are expressed as fertility decline in the current year given a certain level of fertility in the previous year. For most countries, the new model was used to project fertility beginning in 2005, based on the estimated levels of total fertility in 2000-2005. However, in the high-fertility countries where there has been no evidence of fertility decline to date, it was assumed that fertility would remain constant until 2010 and begin to fall according to the model after that year.

Figures VI.1a and 1b illustrate the different trajectories of the three models for different base levels of fertility, here in 2000. A high-fertility country with a total fertility of 8 children per woman in 2000 (figure VI.1a) would reach the fertility floor of 1.85 children per woman with the Fast/Fast model not before the year 2083. Assuming the Fast/Slow and the Slow/Slow model, the fertility floor would be reached after 2100, e.g. after a period of more than 100 years. Figure VI.1a also shows that the Fast/Fast model and the Fast/Slow model show different trends only after fertility declined to about 3 children per woman.

Figure VI.1b shows trajectories of fertility decline for a country with a total fertility of 4 children per woman in 2000. It will reach the fertility floor after 39 year (Fast/Fast model), 61 years (Fast/Slow model) and 62 years (Slow/Slow model). The figure also shows that for countries with medium and low levels of fertility, the Fast/Slow and the Slow/Slow model converge.

b. Age pattern of fertility

For both the high-fertility and medium-fertility countries the age pattern of fertility was projected by interpolating linearly between a starting proportionate age pattern of fertility and a target model pattern. The target pattern is usually attained in either 2045-2050 or in the period when the country reaches its lowest fertility level. Several model patterns of fertility for high- and medium-fertility countries, shown in the annex to this chapter, are available (table VI.4a). In certain cases, the proportionate age pattern of fertility was held constant for the projection period.

2. Low-fertility countries

a. The pace of fertility recovery

Low-fertility countries are those where the total fertility was 2.1 or below in 2000-2005. For those countries, a much simpler model of fertility change was adopted. In general, it is assumed, as in the 2004 *Revision*, that fertility now below replacement level will also converge to the fertility floor of 1.85 children per woman, just as the high and medium fertility countries.

While all low-fertility countries are projected to converge toward a total fertility of 1.85 in the long term, the short-term projection for each country was accomplished taking into account the most recent trends in annual total fertility. For those countries where total fertility was below 1.85 and declining in the 1990s, the annual trend between 1990 and the most recent estimate was generally extrapolated to 2005 or 2010. After that transition period, fertility is assumed to increase linearly at a rate of 0.05 children per woman per quinquennium. Thus, countries whose fertility is currently very low need not reach a level of 1.85 children per woman at the end of the projection horizon in 2050. Several low-fertility countries experienced a levelling-off of fertility decline or a slight increase in fertility in the late 1990s. For these countries, total fertility was generally projected to stay constant near its most recent level until 2005 or 2010. For countries where total fertility in the 2000-2005 was above 1.85 but below 2.1, fertility was projected to decline to 1.85 during the projection period.

Figure VI.1a. High fertility: Trajectories of fertility decline

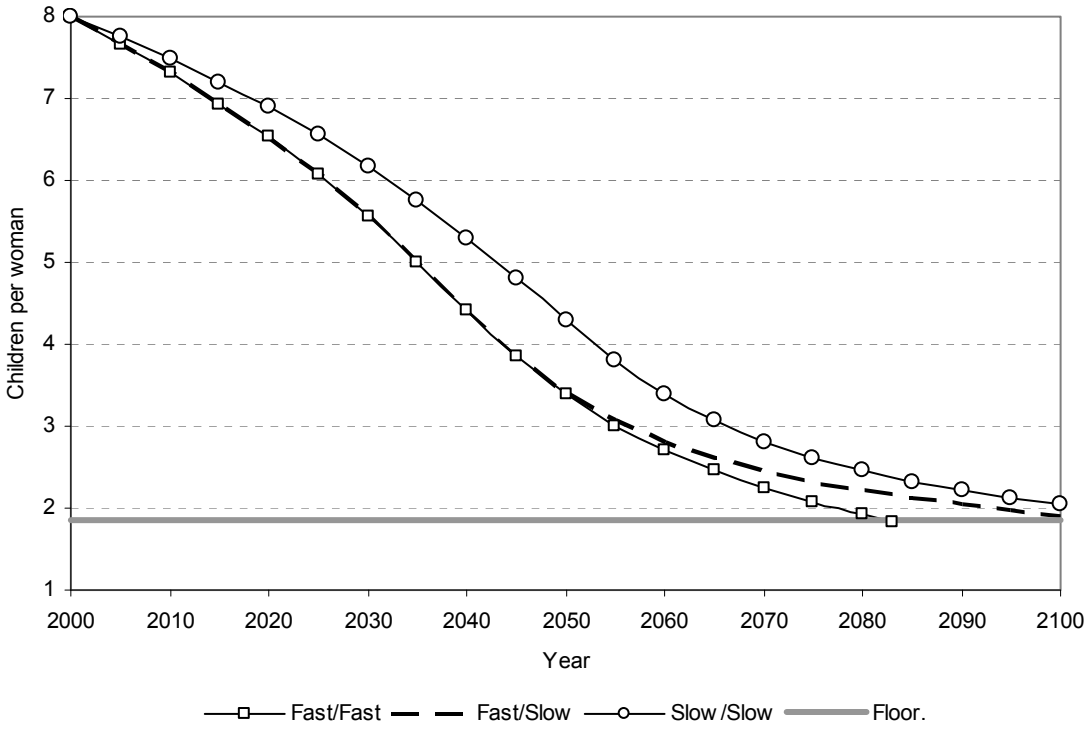
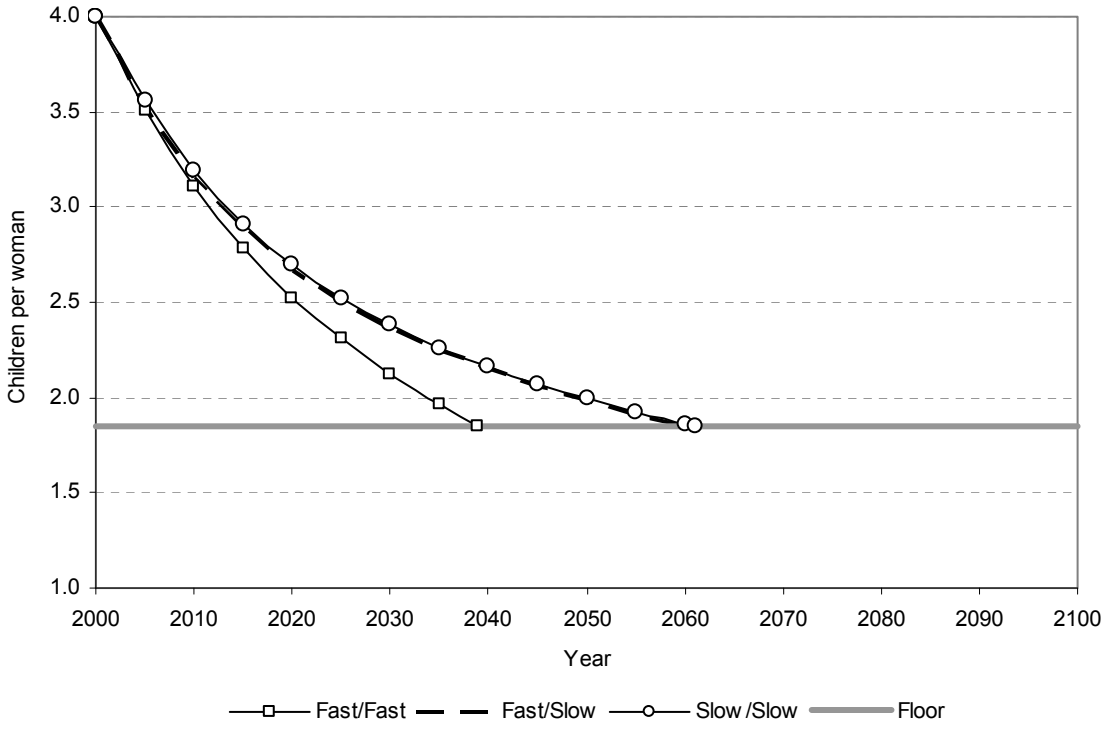


Figure VI.1b. Medium fertility: Trajectories of fertility decline



b. Age patterns of fertility

The projected total fertility levels were converted into age-specific fertility rates by using age patterns of fertility derived by interpolating between the most recent age pattern of fertility available and a model age-specific pattern. For the countries of Europe, model patterns were to be reached by 2025 in the market economy countries and by 2035 in the countries with economies in transition. Linear interpolation was used to move from the current fertility pattern to a model pattern. Once the model pattern was reached, it was assumed to remain constant until the end of the projection period. The model age patterns of fertility used are shown in annex table VI.4b for the market economies of Europe and in annex table VI.4.c for the countries with economies in transition. They were derived from the experience of low-fertility countries by fitting a simple Beta distribution to the age-specific fertility patterns typical of market-economy countries (e.g., the Netherlands) and of countries with economies in transition (e.g., Slovenia). By varying the parameters of the Beta distribution in a manner similar to that implied by past trends, a set of model age-specific fertility patterns was generated with different mean ages of childbearing.

The model age patterns of fertility developed for Europe were also used for several of the low-fertility countries outside of Europe. In certain other low-fertility countries, the proportionate age pattern of fertility was assumed to remain constant over the projection period.

C. THE PROJECTION OF MORTALITY

In contrast with the assumptions made about future fertility trends, only one variant of future mortality trends was used for each country for the standard variants (high, medium and low variants). It must be noted, however, that the estimation and projection of HIV/AIDS related mortality, documented below, made it necessary to prepare an additional mortality variant with No-AIDS mortality for all countries with significant HIV prevalence (see chapter IV).

Assumptions are made in terms of life expectancy at birth by sex and, in most cases, an underlying model life table. As in previous *Revisions*, life expectancy was generally assumed to rise over the projection period for most countries. The major exceptions are the countries affected by the HIV/AIDS epidemic (explained below), and countries with economies in transition.

1. General approach

The often dramatic decline of mortality was - and is - a driving force behind the profound changes to population trends observed during the past two centuries. While first limited to a small number of countries in the world, the decline of mortality and rise in life expectancy has now become a global phenomenon.

For countries where mortality was assumed to follow a declining trend starting in 2005, the pace of change of life expectancy was set according to a chosen model. The *2004 Revision* added two new models of gains in life expectancy to the existing three that were available in previous *Revisions*, namely a very slow and a very fast model of mortality improvement. Altogether, a total of five mortality models are now available: the new very fast model, the established fast, medium and slow models, and a new very slow model. The addition of the two additional models was necessary because some countries have experienced smaller gains in life expectancy than the traditional slow model suggested, while other countries have experienced consistently faster increases in life expectancy than the fast improvement model envisioned (see tables 5 and 6, Annex).

All five models are based on a broad empirical basis of increasing life expectancy during the period 1950 to 2005, covering life expectancies between 50 and about 85 years. The models represent the average experience of this historical period grouped according to the 90th percentile (very fast, modelled on Japan), the 75th percentile (fast model) the arithmetic mean (medium model), the lowest 25th percentile (slow model), and the lowest 10th percentile (the very slow model).

In order to be useful for the projection of life expectancy for advanced countries such as Japan, the models needed to be extended to cover levels

of life expectancy not yet achieved. Such an extension was carried out to levels of life expectancy of 92.5 years by extrapolating the trends in the given models using the Lee-Carter model (United Nations 2004b). Because an unconstrained extrapolation of declining gains in life expectancy would ultimately yield zero and even negative increments, it was assumed that after the gains in life expectancy reached a certain low level, future gains would stay constant at this lowest increment. While there is no strong empirical basis for such an assumption, there is also no evidence today of a particular upper limit to life expectancy (Oeppen, Vaupel 2002). Indeed, as Tuljapurkar and Li (2004) have shown, under certain conditions, a linear trend in life expectancy, and thus a constant increment, is possible.

The five models of gains in life expectancy have been implemented as logistic functions, documented in the annex to this chapter. The models are expressed as annual increments of life expectancy for a given level of life expectancy, but are presented in the annex for the ease of use as quinquennial increments.

Although all models differ regarding the amount of change or increments of life expectancy during a given period of time, they all share a general feature of the evolution of life expectancy: very low life expectancy is associated with small gains in life expectancy, as was the case before the onset of the demographic transition. Increments in life expectancy increased during the early stages of the demographic transition and reached a peak when life expectancy was between 50 and 60 years. As mortality is further reduced, annual gains in life expectancy tend to become smaller.

Figures VI.2a and 2b illustrate the different trajectories of the five models for different base levels of life expectancy at birth, here in 2000-2005 for males for two countries: one with the lowest life expectancy at birth (Zambia) and the other with the highest (Iceland) worldwide. A low male life expectancy country with 39 years in 2000-2005 (figure VI.2a) would reach by 2045-2050 between 50 years (very slow model) and 67 years (very fast model) while a medium pace of improvement in life expectancy implies about 59 years. Figure VI.2a also shows that once life expectancy reaches about 60 years additional gains are assumed to be smaller.

Figure VI.2b shows trajectories of gains in life expectancy for a country with the highest male life expectancy in 2000-2005 (Iceland). It is expected to reach between 82 and 86 years of life expectancy by 2045-2050, depending on the models used (the medium model would imply about 84 years). The figure also shows that even at these high levels of life expectancy, none of the model assumes any limit to potential continued improvements.

For any given country, the appropriate model was chosen by taking into account the observed pace of mortality decline in the recent to medium-term past. The selected model of improvement in life expectancy was generally followed until 2025 and, if deemed appropriate, a switch was made as of that date to the medium-pace model.

In countries with economies in transition that experienced a long period of stagnating or even increasing mortality, life expectancy was assumed to increase only very little until 2005-2010; it was then assumed to follow one of the models just described.

Once the path of future expectation of life was determined, survival ratios by five-year age group and sex consistent with the expectation of life at birth for each quinquennium were calculated. For countries with recent empirical information on the age patterns of mortality, survival ratios for the projection period were obtained by extrapolating the most recent set of survival ratios by the rates of change of an underlying model life table. In other words, under such a procedure the empirical or estimated age pattern of mortality converges towards the underlying model pattern as life expectancy changes over time. For countries lacking recent or reliable information on age patterns of mortality, survival ratios were directly obtained from an underlying model life table. A choice could be made among nine model life table systems, four proposed by Coale and Demeny (1966; Coale, Demeny, Vaughn 1983; Coale, Guo 1989) and five model systems for developing countries produced by the United Nations (1982). These nine model life tables have been updated

Figure VI.2a. Low life expectancy: Trajectories of gains in life expectancy, males

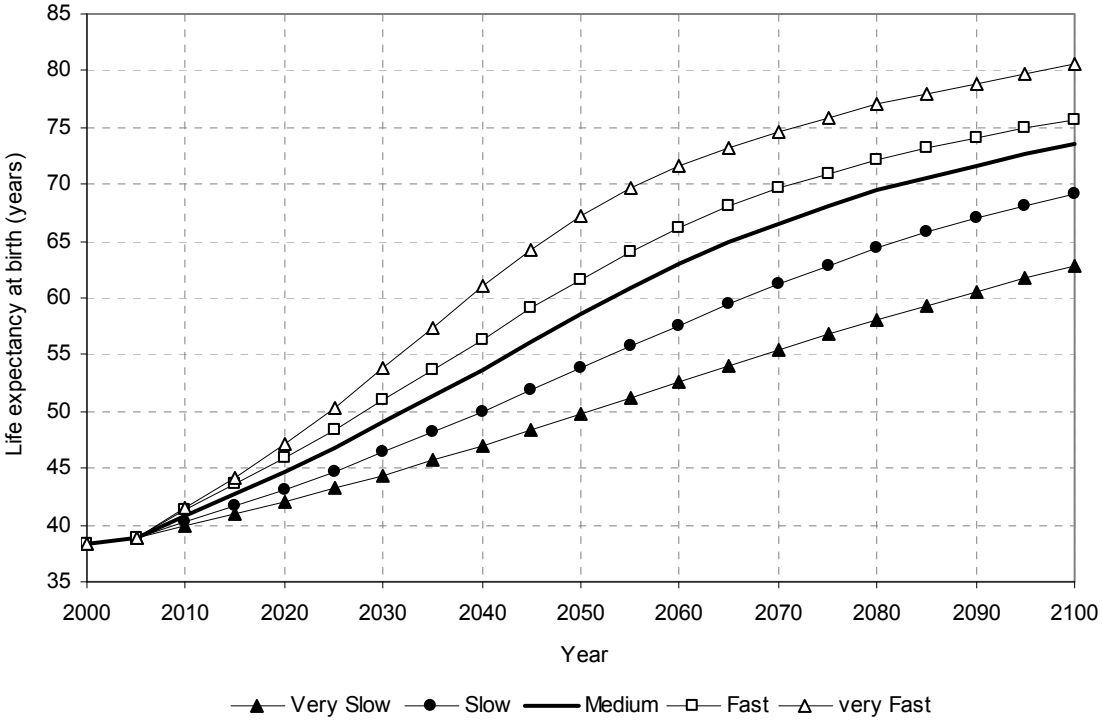
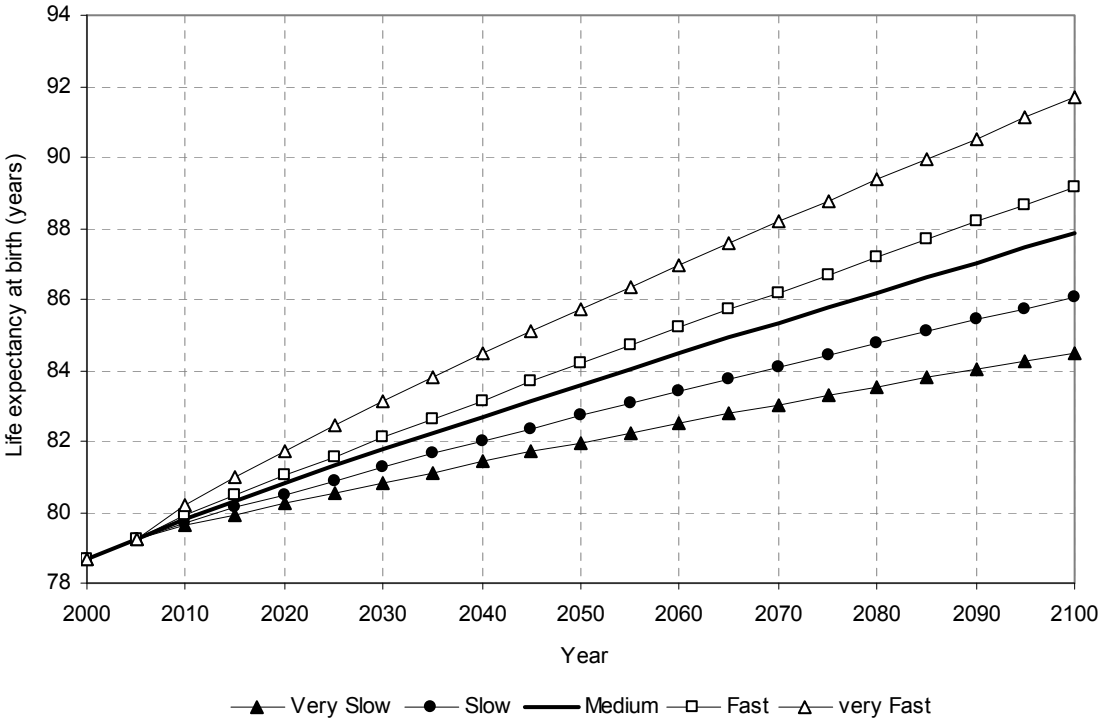


Figure VI.2b. High life expectancy: Trajectories of gains in life expectancy, males



and extended by the Population Division in order to cover the whole age range up 100 years, and a range of life expectancies from 20 to 92.5 years (for more details, see Buettner, 2002). It must be noted that the last available entry in the revised system of model life tables of 92.5 year of life expectancy, for both males and females, are not meant to represent a ceiling for human longevity.

The general approach to the projection of mortality just described is not appropriate for countries significantly affected by the HIV/AIDS epidemic. A detailed description of assumptions made and models used to estimate and project the demographic impact of HIV/AIDS is given in the next section.

2. Modelling HIV/AIDS mortality

This *Revision* incorporates explicitly the impact of the HIV/AIDS epidemic for 62 countries, most of which had an adult HIV prevalence of at least one per cent in 2005. Brazil, China, India and the United States of America, countries where HIV prevalence is low but which had a large number of infected persons, were also included. Among the 62 countries considered, 40 countries are in Africa, 5 are in Asia and 11 in Latin America and the Caribbean (table VI.2). For those countries, a different approach for the estimation and projection of mortality must be used. Unlike other infectious diseases, HIV/AIDS has a very long incubation period in which an infected person is mostly symptom-free but infectious.

Also unlike many other infectious diseases, individuals do not develop immunity, but, in the absence of treatment, almost always die as a consequence of their compromised immune system. Another reason for an explicit modelling of the HIV/AIDS is the avalanche-like process of the infection spreading through a population and the particular age pattern exhibited by HIV/AIDS. The additional deaths due to HIV/AIDS, predominantly adults in their reproductive age, are consequently distorting the usual U-shaped age-specific age profile of mortality, a feature which cannot be found in the model life tables that are available to demographers (Heuveline, 2003). Thus the particular dynamic of this disease and the severity of its outcome require an explicit modelling of the epidemic.

As a consequence, instead of an overall mortality process that can be captured by standard age patterns of mortality and smooth trends of changing life expectancy, for countries highly affected by HIV/AIDS, two separate mortality processes must be modelled: the mortality due to the HIV/AIDS epidemic itself and the mortality that prevails among the non-infected population. The latter is often called "background mortality". The estimation of it is described in the next section.

a. Establishing background mortality

For countries severely affected by HIV/AIDS, hypothetical mortality paths for what is often called "background" or "No-AIDS mortality" needed to be constructed first. The background mortality is the mortality experienced by those not infected with HIV in a given country and at a given period of time. It is not the mortality that would have been observed in the complete absence of HIV/AIDS in that country, however. The distinction between background mortality and mortality in the absence of HIV/AIDS is of little importance during the first years the epidemic develops in a given country. But once a sizeable number of people is infected and ultimately dies of AIDS, the consequences of the epidemic are likely to affect severely the capacity of a country to provide health care services to its population, including the uninfected people. It is for this reason that the assumed trends in background mortality are generally less optimistic than in a similar country that is not affected by HIV/AIDS.

The background mortality can be estimated from data on causes of death (deaths caused by HIV and deaths due to other causes). Such detailed account of deaths by causes of deaths and by age and sex, however, is rarely available in countries in less developed regions that are severely affected by the epidemic. Therefore, background mortality needs to be estimated by assuming plausible levels and trends based on other information or assumptions. Often the process is one of iterative refinement: beginning

TABLE VI.2. HIV PREVALENCE IN THE COUNTRIES MOST AFFECTED BY THE HIV/AIDS EPIDEMIC, 2005 AND 2025

Country		Prevalence (percentage) 2005	Prevalence (percentage) 2025	Change between 2005 and 2025
Africa				
1.	Angola	3.6	3.2	-0.4
2.	Benin	1.8	1.0	-0.7
3.	Botswana	24.4	16.3	-8.1
4.	Burkina Faso	2.0	1.6	-0.5
5.	Burundi	3.2	2.7	-0.5
6.	Cameroon	5.5	4.6	-0.9
7.	Central African Republic	10.7	9.6	-1.2
8.	Chad	3.5	2.9	-0.6
9.	Congo	5.3	4.4	-0.9
10.	Côte d'Ivoire	7.0	6.2	-0.8
11.	Dem. Rep. of the Congo	3.2	2.8	-0.4
12.	Djibouti	3.1	2.7	-0.5
13.	Equatorial Guinea	3.2	2.8	-0.4
14.	Eritrea	2.4	2.1	-0.3
15.	Ethiopia	2.0	1.6	-0.3
16.	Gabon	7.9	6.8	-1.1
17.	Gambia	2.5	2.1	-0.3
18.	Ghana	2.3	2.0	-0.3
19.	Guinea	1.5	1.1	-0.4
20.	Guinea-Bissau	3.7	3.1	-0.6
21.	Kenya	6.2	4.8	-1.4
22.	Lesotho	23.1	20.0	-3.2
23.	Liberia	3.3	3.1	-0.3
24.	Madagascar	0.5	1.0	0.5
25.	Malawi	14.1	12.6	-1.5
26.	Mali	1.7	1.5	-0.3
27.	Mozambique	16.3	13.7	-2.7
28.	Namibia	19.7	17.2	-2.5
29.	Niger	1.1	0.9	-0.2
30.	Nigeria	3.9	3.2	-0.7
31.	Rwanda	3.5	2.0	-1.6
32.	Sierra Leone	1.6	1.3	-0.3
33.	South Africa	18.9	13.9	-5.0
34.	Sudan	1.6	1.4	-0.2
35.	Swaziland	33.8	27.9	-5.9
36.	Togo	3.2	2.7	-0.5
37.	Uganda	6.6	5.7	-0.9
38.	United Republic of Tanzania	6.5	5.5	-1.0
39.	Zambia	16.9	15.0	-1.9
40.	Zimbabwe	20.0	13.5	-6.5

TABLE VI.2. (*continued*)

Country		Prevalence (percentage) 2005	2025	Change between 2005 and 2025
Asia				
1.	Cambodia	1.7	0.4	-1.3
2.	China	0.1	0.0	0.0
3.	India	0.9	0.7	-0.2
4.	Myanmar	1.3	0.9	-0.3
5.	Thailand	1.3	1.0	-0.3
Europe				
1.	Estonia	1.3	1.1	-0.2
2.	Moldova	1.1	1.1	0.0
3.	Russian Federation	1.1	1.4	0.3
4.	Ukraine	1.4	1.2	-0.3
Latin America and the Caribbean				
1.	Bahamas	2.7	2.2	-0.5
2.	Barbados	1.4	1.0	-0.4
3.	Belize	2.4	3.1	0.7
4.	Brazil	0.4	0.4	0.0
5.	Dominican Republic	1.1	0.8	-0.3
6.	Guyana	2.4	1.8	-0.6
7.	Haiti	3.8	3.1	-0.7
8.	duras	1.5	1.4	-0.1
9.	Jamaica	1.5	1.2	-0.3
10.	Suriname	2.0	1.5	-0.5
11.	Trinidad and Tobago	2.6	1.5	-1.0
Northern America				
1.	United States of America	0.5	0.6	0.1
Oceania				
1.	Papua New Guinea	1.8	1.6	-0.2

NOTE: Prevalence relates to the population aged 15-49.

with an assumed trend of the background mortality, the HIV/AIDS epidemic is modelled and the results are then compared with overall mortality estimates, if they are available (see, for example, Feeney, 2001), or with results provided by a census or survey. If necessary, background mortality is adjusted, and the procedure is repeated until a reasonable agreement between the model output and available evidence is achieved.

b. Modelling the overall dynamic of the epidemic

The approach of the Population Division to model the dynamics of the HIV/AIDS epidemic follows that suggested by the UNAIDS Reference Group on Estimates, Modelling and Projections (2002). UNAIDS has implemented this model in a software package called Epidemiological Program Package or EPP, described in Ghys et al (2004). In the following, both the epidemiological model and its software implementation are called EPP for short.

The first stage in modelling the epidemic is to derive estimates of the yearly probability of being infected by HIV (annual incidence) from available estimates of HIV prevalence. In countries of sub-Saharan Africa these prevalence estimates are derived mainly from data on the proportion of seropositive females among pregnant women

attending antenatal clinics that belong to the system of sentinel surveillance sites in each country. Consequently, available estimates of prevalence refer to the HIV prevalence among pregnant women only. It has been shown, however, that prevalence levels among pregnant women aged 15-49 provide reasonable estimates of prevalence levels among all women in the same age group (Gregson and Zaba, 1998; Glynn et al, 2001; Gregson, Zaba and Hunger, 2002). There is scant information on how well prevalence levels among pregnant women represent those among men. Only recently have nationally representative surveys of HIV seroprevalence begun to be taken in countries of sub-Saharan Africa; their results will inform modelling specification in future *Revisions*. In the absence of more information, the models presented here assume that available estimates of prevalence among pregnant women aged 15-49 are adequate proxies of HIV prevalence among both women and men.

The EPP model divides the total population of persons over 15, denoted by N, into three groups (figure VI.3):

- Persons who, at time t, are not at risk of being infected by HIV, denoted by $X(t)$.
- Persons already infected by HIV at time t, denoted by $Y(t)$;
- Persons at risk of being infected by HIV at time t, denoted by $Z(t)$,

The model of the HIV/AIDS epidemic is described by a system of three differential equations (see annex), with the following four parameters to be estimated:

- *The parameter f0* is the fraction of individuals who entered the at-risk population at age 15 at the time the HIV epidemic started. This parameter determines the endemic level of the epidemic.
- The parameter r represents the force of infection or reproductive potential of the epidemic. It is the probability that interactions between an infected and a non-infected individual results in the infection of the latter. This parameter governs to a large extend how the epidemic grows: If r is larger than one, the epidemic grows, if it is smaller than one, the epidemic will disappear over time.
- *Φ (Phi)* captures the recruitment of people into the at-risk population and is therefore also called the behavioural or response parameter. If Φ is positive, more people are entering the at-risk population than die of the epidemic. As a consequence, the epidemic is sustained at a higher level. If Φ is negative, less people are entering the at-risk population than die of the epidemic. With Φ negative, the epidemic declines.
- The parameter *t0*, the year the epidemic started in a particular country.

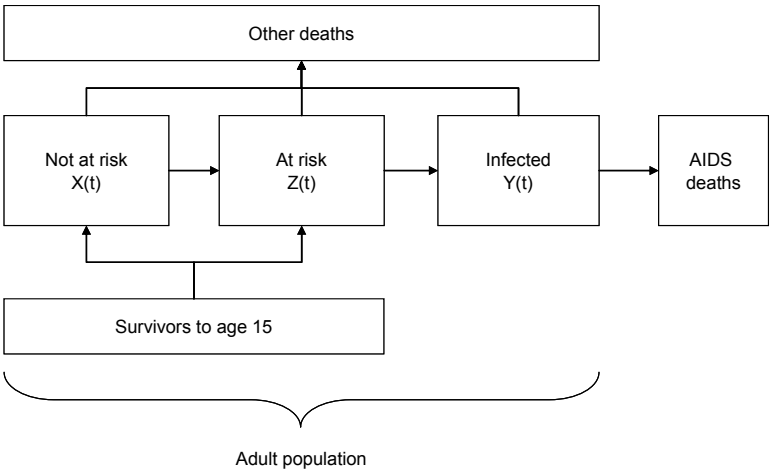
In order to keep the number of parameters to be estimated to a minimum, other information necessary to formulate the epidemiological model are set to predetermined values, such as the rate of Mother-To-Child Transmission (MTCT), the incubation period (time from infection to death caused by HIV/AIDS), and the fertility reduction associated with a HIV positive status of women. Demographic parameters such as the crude birth and death rates as well as the probability of survival from birth to age 15, the age of entry into the adult population, are taken from the No-AIDS scenario.

In the original implementation of the model, the parameters r, *f0, Φ* and *t0* are kept constant over time, assuming that they will not change significantly during the relatively short period of 20 to 30 years covered by the model. However, over longer periods, as in this *Revision*, the impact of the epidemic itself on the demographic variables needs to be explicitly taken into account. In addition, behavioural change as well as medical treatment of infected people is poised to alter the dynamics of the epidemic. For those reasons, the implementation of the epidemiological model by the Population Division allows for changes over time for most parameters.

In addition, because of the inclusion of Anti-Retroviral Treatment (ART), additional parameters - the coverage rate of ART treatment and annual survival for people under treatment - were included. These additional parameters are set outside the model and not obtained from fitting the model to empirical data.

The system of differential equations of the EPP model can be solved numerically by using, for instance, the Runge-Kutta method, provided

Figure VI.3. Structure of the EPP model



values of all relevant parameters are known. Population-based estimates of population size at the start of the epidemic, births and mortality risks over time are available. In addition, assumptions are made about the probabilities of dying of AIDS among those infected, about the probability of mother-to-child transmission and about the extent to which the fertility of HIV-positive women is reduced. Then it is possible to estimate, via numerical approximation methods, the values of *r*, f0 and *Φ* that minimize the distance between the HIV prevalence generated by the model and the HIV prevalence estimated on the basis of data from antenatal clinics at various points in time. More specifically, a non-linear iterative optimization procedure is used to obtain estimates of the parameters *r*, *f0, Φ and t0*.

This simple epidemiological model is capable of producing a large number of different epidemics and thus can be applied to countries with varying levels of severity of the epidemic.

This versatility is illustrated below by comparing epidemiological curves produced by varying one parameter while keeping all others constant. Each of the four parameters shapes the epidemiological curve in a particular way, allowing to attribute certain characteristics of the epidemic to one particular parameter.

The fraction of new entrants to the at-risk population, *f0*, largely determines the endemic level of the epidemic (figure VI.4a). If, at the beginning of the epidemic, a large fraction of people is already in the at-risk category, the epidemic will level off at higher level than in cases where initially the fraction of the at-risk population is smaller.

The force of infection (parameter *r*) determines the growth of the epidemic (figure VI.4b). A higher force of infection results in a faster growth of the epidemic, with a higher endemic level after the peak prevalence. A lower force of infection, on the other hand, produces an epidemic curve that grows slower, reaches its peak prevalence later and also has a lower endemic level.

The parameter Φ models the recruitment of people into the at-risk population (figure VI.4c). If Φ is zero, then the at-risk population maintains its initial fraction of the population, that is *f0*. A positive Φ means that more people are recruited into the at-risk population, resulting in an epidemic with higher endemic level. If Φ is negative, the prevalence of the epidemic declines more rapidly because the number of people dying of AIDS is larger than the number of people entering the at-risk population.

The parameter t0 determines when the epidemic started in a given country. This parameter simply shifts a given epidemic curve horizontally on the time axis. It is not shown as a chart.

Figure VI.4a. Initial fraction of people in at-risk population

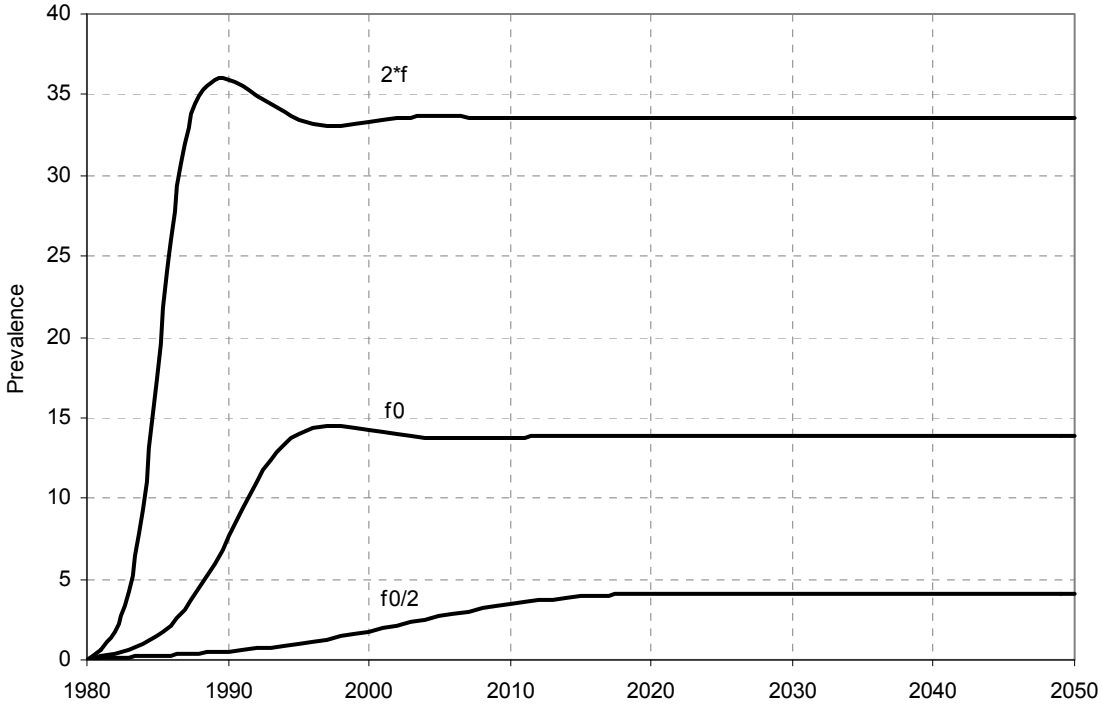


Figure VI.4b. Force of infection

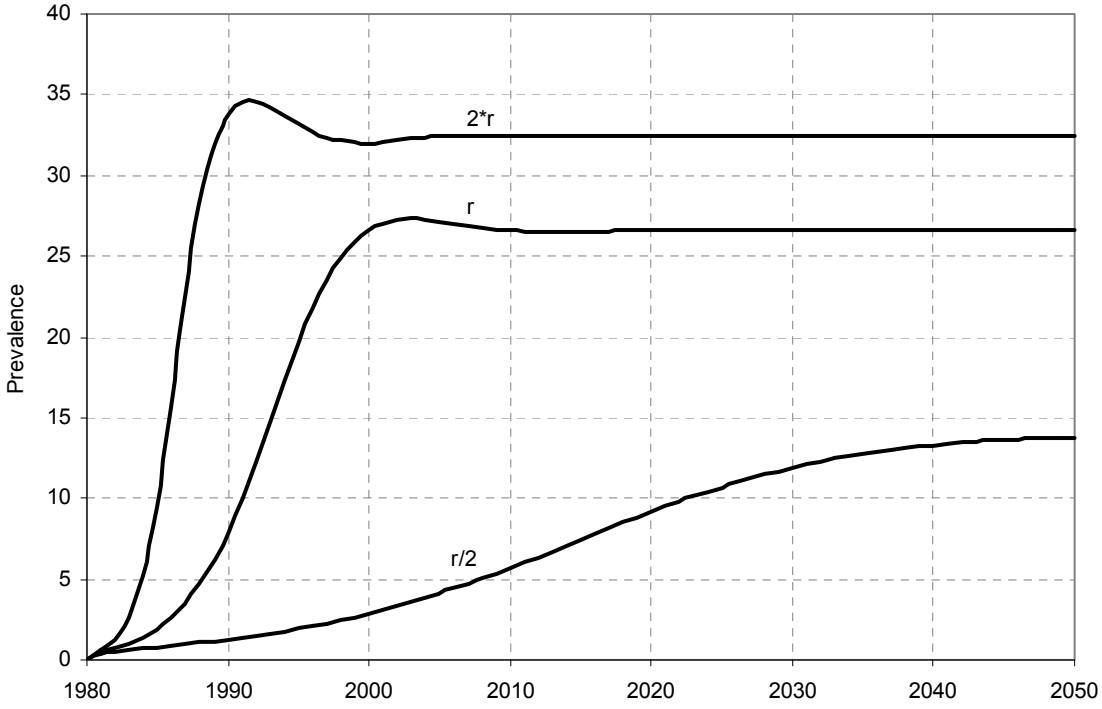
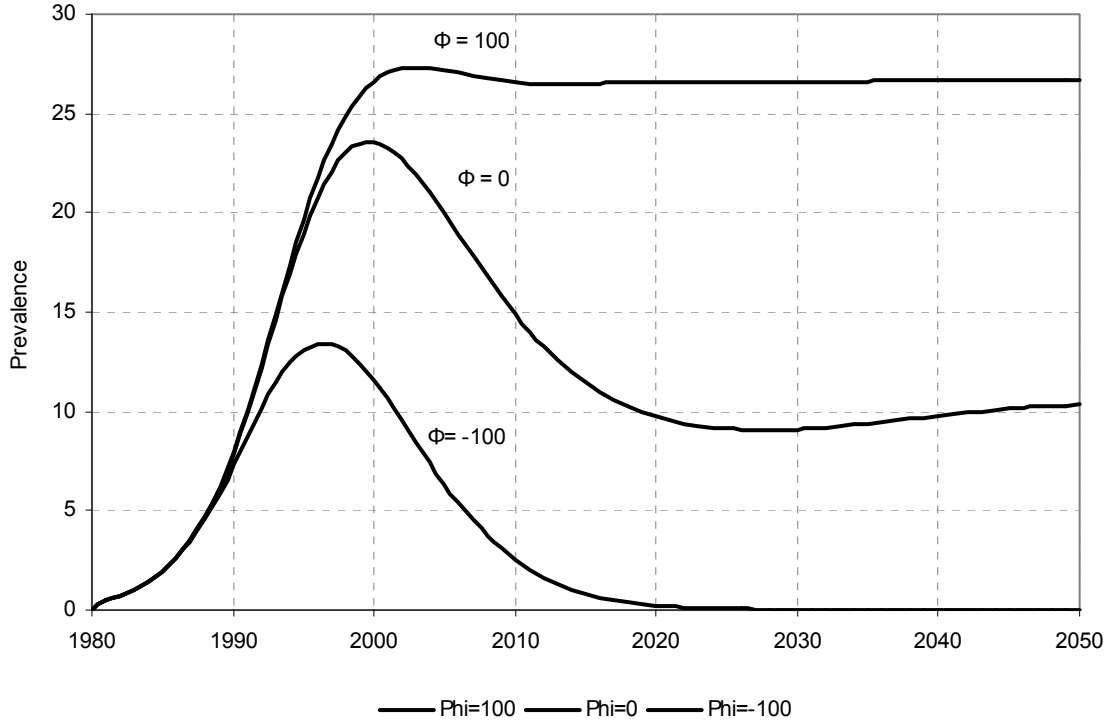


Figure VI.4c. Recruitment into at risk population



Once the values of all parameters are obtained, the mathematical model is used to calculate the number of adult persons living with HIV, the number in the at-risk group and the number who are not susceptible, as well as the number of newly infected individuals for each year *t* ranging from the start of the epidemic to 2005, the most recent year with data on prevalence available at the time of this *Revision*. Also calculated is the incidence rate for the total population at risk.

However, in order to estimate the effect of the HIV/AIDS epidemic on mortality and population dynamics, it is necessary to derive estimates of the infected population by age and sex. The procedures followed in such derivation are described in the next sections.

c. Estimating the demographic impact of HIV/AIDS

The simple epidemiological model EPP just outlined captures the overall dynamics of the epidemic for three sub-population groups. It does not, however, allow for a detailed account of the demographic impact of the epidemic. As mentioned, no provision is made for a disaggregation by age or sex, two key elements of a demographic analysis of the epidemic. Modelling only adult populations, it does not include explicitly the paediatric dimension of the epidemic. In order to generate a full account of the demographic impact of HIV/AIDS, the Population Division developed abcDIM[1] a software package that combines the EPP model with a full multistate demographic projection model. In it, the epidemiological dynamics captured in EPP are translated into age-and sex specific values, thus providing a full demographic account. Figure VI.5 shows the schematic structure of the model used in abcDIM for modelling adult mortality, and figure VI.6 depicts the schematic specifications for children infected at birth (paediatric HIV/AIDS).

The estimation of the demographic impact of HIV/AIDS is carried out in several steps. First, the EPP epidemiological model needs to be extended until 2050, the final projection year in this *Revision*. While the simple epidemiological model used by UNAIDS makes the implicit assumption of constant parameters, for long range projections such a simplification cannot be maintained. In

[1] Its name is derived from Demographic Impact Model (abcDIM).

Figure VI.5. Structure of the abcDIM model for the adult population

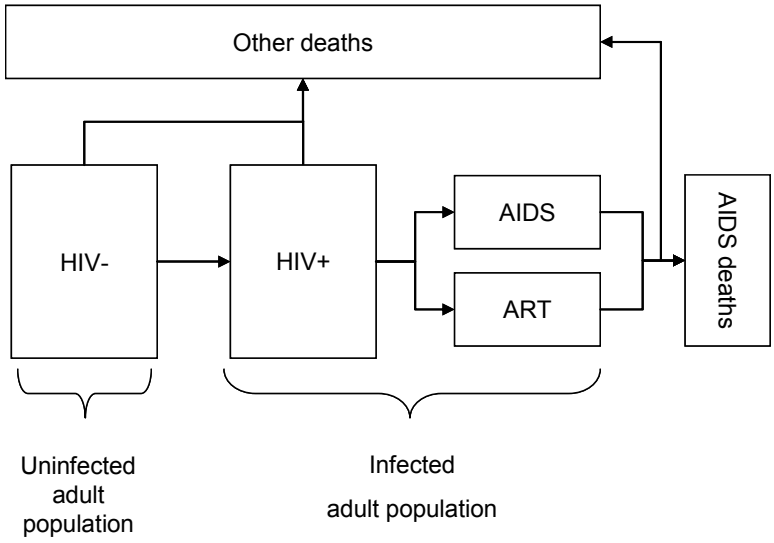
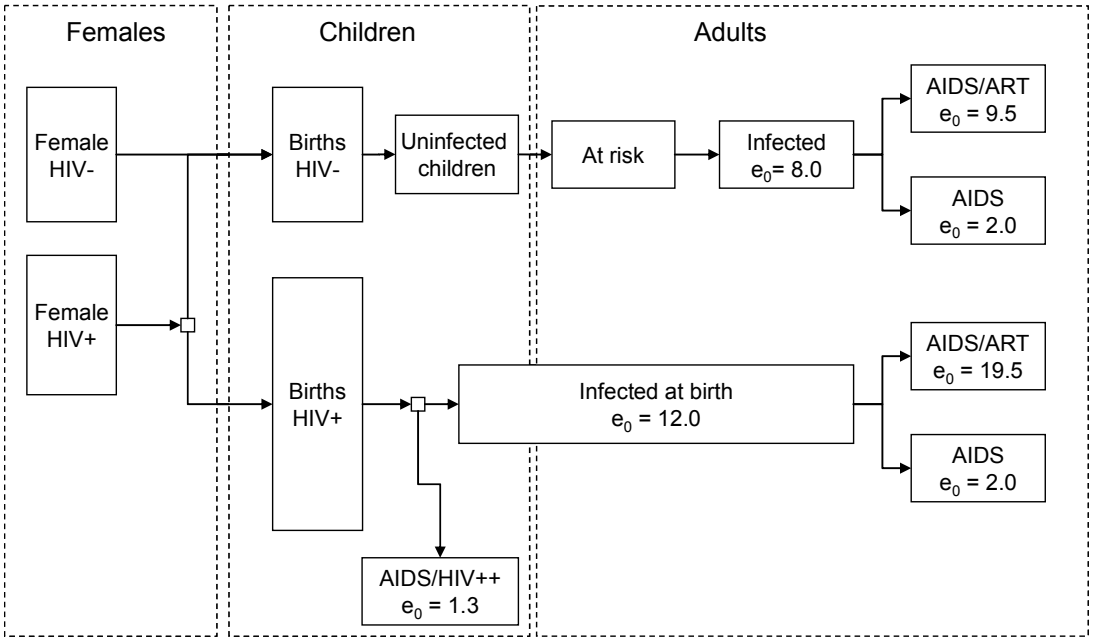


Figure VI.6. Structure of the abcDIM model for children



particular, the parameters of the model that capture behavioural elements, such as Φ and r, cannot be assumed to be constant throughout this period. Instead, in order to incorporate the effects of intervention, such as treatment, or prevention, such as increased condoms use, reasonable assumptions about future trends of these parameters are needed.

For this *Revision*, Φ, r and the Mother-to Child Transmission (MTCT) are assumed, after 2005, to decline over time, reflecting the impact of interventions and behavioural change. The declining trend in these parameters can be specified in abcDIM by assuming a halving period, that is the number of years it take to reduce the value of the parameter to half the value it had at the beginning of the projection period. The default values for the halving times are 10 years for MTCT, 30 years for r, and 20 years for Φ.

The parameters just described influence the number of people that are being newly infected, but they do not alter the chances of survival once a person is infected. Anti-retroviral treatment, on the other hand, results in longer survival of infected people. As in the previous *Revision*, the effects of life-prolonging ART have been included into the abcDIM model by adding separate stages for those receiving ART (labelled "ART" in figures VI.5 and VI.6) to the demographic projection model. In order to account for longer survival of infected people receiving anti-retroviral treatment, the composite survival time in EPP was prolonged accordingly. Consequently, depending on the proportion of HIV positive people receiving treatment and the percentage of people under treatment surviving annually, the overall survival time in EPP is dynamically adjusted in order to reflect the impact of treatment on survival of infected people.

Then, the estimates of annual HIV incidence derived from the epidemiological model with all sexes and ages combined are converted into age and sex-specific estimates of newly infected individuals and the population that was initially free from the epidemic is projected using a multi-state approach that tracks the transitions of adult people from at-risk to AIDS and finally deaths.

All sub-populations are projected by single years of age while the infected population is further classified by duration since infection in single years. The exact steps followed and the assumptions made in recreating the dynamics of a population affected by the HIV/AIDS epidemic are described in detail below.

Step 1: *Derivation of the number of new infections by sex*

As noted above the model used to derive the parameters *r*, *f0* and *Φ* does not take into account the age or sex of the population infected. To derive estimates of the impact of HIV/AIDS by age and sex, it is first necessary to distribute by sex the yearly number of newly infected individuals, as yielded by the general epidemiological model EPP. Although data on the distribution by sex of newly infected individuals are rare, there is some evidence suggesting that when HIV/AIDS is spread mainly by heterosexual transmission, the proportion of males among the newly infected is high at first but declines rapidly in the years following the start of the epidemic to proportions closer to those of women.

On the basis of this observation, the proportion of males among the newly infected is assumed to decline from 80 per cent or so at the start of the epidemic to 45 per cent after a few years and to remain constant at that level for an extended period. However, in regions or countries where HIV/AIDS is not spread primarily by heterosexual contact (e.g. homosexual contact, intravenous drug use, etc.), sex patterns of newly infected individuals differ, with higher proportions being attributed to men. Under these assumptions, the annual number of newly infected individuals per year is distributed by sex.

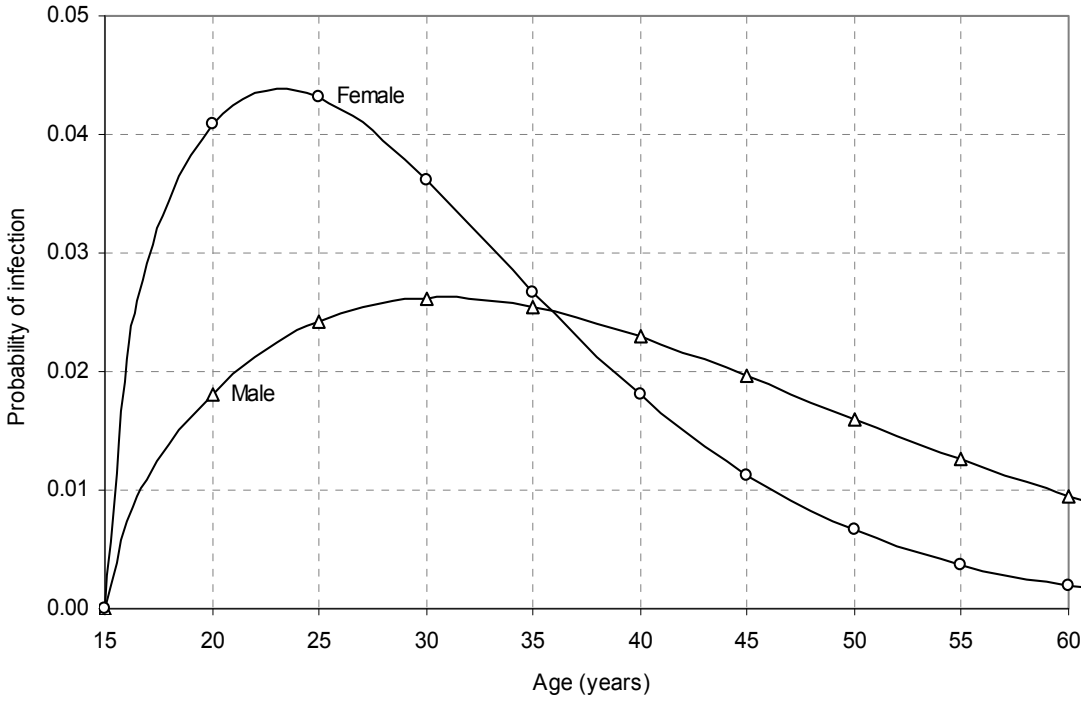
Step 2: *Derivation of the number of newly infected men and women by age*

Once estimates of the newly infected people by sex are available, they are distributed by single-years of age according to model age distributions derived from empirical data that were fitted to a Weibull distribution, with a mean age at infection of 41.0 years for males and 28.3 years for females in annex table VI.8). Figure VI.7 shows the density functions by age for males and females.

Step 3: *Estimation of the number of deaths caused by AIDS among HIV positive persons*

Infected people are passing first through a stage equivalent to stages 1 through 3 of the WHO staging system (WHO, 2004) in which they are

Figure VI.7. Age specific HIV infection probabilities by sex



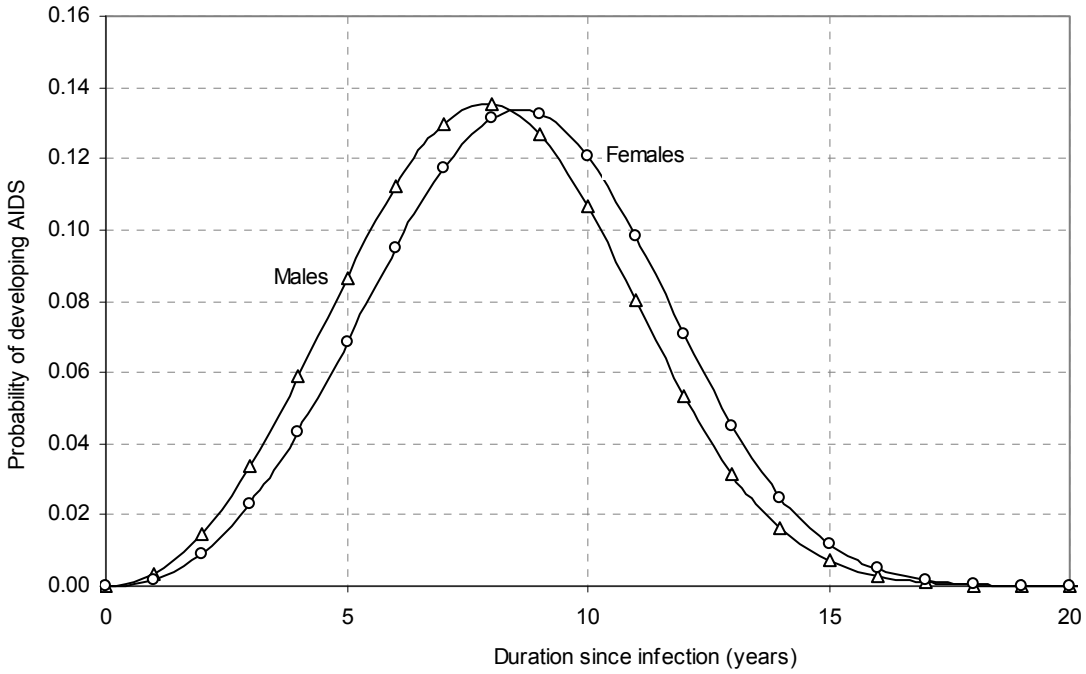
infected but, at least in stages 1 and 2, asymptomatic. Deaths that occur during those stages are not caused by HIV/AIDS. In figure VI.5, these three clinical stages are aggregated into the stage labelled "HIV+". Infected people can enter two possible final stages, associated with full-blown AIDS (stage 4 by WHO classification). In the stage labelled "AIDS", people do not receive ART, and it is therefore assumed that they have a further average life expectancy of just two years. In the stage labelled "ART" they receive life-prolonging treatment, and their average remaining life time will be increased well beyond the two years associated with the stage without treatment.

To estimate the number of deaths due to AIDS by age and sex, the infected population is projected over time using a multi-state approach that takes account of the competing risks of moving from being uninfected to being infected (HIV-positive) and from being HIV-positive to developing full blown AIDS versus the probability of dying of a cause other than AIDS. The probability schedules used to reflect the chances of developing full blown AIDS after x years of infection (the incubation period) are assumed to follow a Weibull distribution (see annex table VI.9). Different schedules were used for each sex, with a mean incubation period of about 8.3 years for both sexes combined, a slightly longer mean incubation period for females (8.6 years) and a shorter one for males (8.0 years). The schedules are shown in figure VI.8.

The probability of progressing from HIV infection to full-blown AIDS was assumed to be age-neutral, that is no allowance was made for systematic differences in the incubation period related to age at infection.

Competing mortality risks for causes other than AIDS were estimated on the basis of mortality estimates for the whole population. It was assumed that among HIV positive persons, the risk of dying of a cause other than AIDS was independent from the risk of dying of AIDS.

Figure VI.8. Annual probability of transition from HIV infection to clinical stage 4



Once an infected person reaches stage 4, or full blown AIDS, he or she is in need for treatment with ART. In resource-poor settings such as in most developing countries, treatment is not available for the whole group of infected people reaching stage 4. The abcDIM program therefore allows setting a time varying parameter, the coverage rate, to reflect this situation. Table VI.10 in the annex lists country specific values of assumed current and future coverage rates for all the countries concerned.

It was mentioned earlier that the default mean survival time of people entering stage 4 or full-blown AIDS is approximately two years. With treatment, survival of infected people is extended. Exponential function are used to model the survival with or without treatment in abcDIM; parameterized as constant annual per cent survival. Based on available empirical evidence, this *Revision* implements 5 different survival regimes fro people receiving ART that reflect efficiency of the treatment regimes (see annex table VI.11).

Step 4: *Calculation of the number of children infected by HIV/AIDS*

Although HIV is primarily transmitted by sexual contact, which places adolescents and adults at risk, it also exerts a heavy toll on children. Children are infected by their HIV positive mothers passing the virus to their children in utero, at parturition or during breastfeeding. To estimate the number of children that can potentially become infected by their mothers, first the number of children born by HIV-positive women is calculated, allowing for a reduced fertility that takes into account the lower probability of conception among HIV-positive women. In this *Revision*, it was uniformly assumed that HIV positive women have a 20 per cent lower age-specific fertility than those not infected. Because most HIV-positive children acquire the disease from their infected mothers at or near the time of birth, the number of HIV-positive children is obtained by assuming a fixed rate of transmission of HIV from mother to child of 35 per cent and multiplying it by the number of

children born to HIV-positive women. Such an approach produces the number of children who become HIV positive at birth or soon thereafter during each year. In addition, the age-specific fertility rates applied to non-infected women are increased in such a way that the overall fertility rates of the population as a whole (both infected and not infected women) match those estimated from available data.

Step 5: *Calculation of the number of AIDS deaths among children*

In children, the length of infection is the same as their age. The number of surviving HIV-positive children is calculated by modelling the probability that infected children have of surviving HIV infection passed on to them at or shortly after birth. The survivorship of infected children in this *Revision* takes explicitly account of varying access to paediatric treatment and characteristic survival patterns. HIV-infected children are divided into two groups: (i) fast progressors, e.g. those infected in-utero, among whom the disease progresses rapidly with an average survival time about just 1.3 years, and (ii) slow progressors, e.g. those infected at parturition or during breastfeeding,[2] among whom the disease progresses slowly with an average survival time of 14 years, both groups without treatment. Explicit inclusion of paediatric treatment is done via country-specific coverage rates which average 9 per cent in 2005 but vary between 0 and 99 per cent among the 62 affected countries. By 2015, the projected coverage is expected to reach 60 per cent on average varying from 40 per cent to 100 per cent among the affected countries. Coverage levels remain constant from 2015 to 2050 at the level reached in each country by 2015. The annual survival of children receiving treatment is 95 per cent, so that their mean survival time is 19.5 years in the absence of other causes of death (annex tables VI.12a and VI.12b, figures VI.9a and VI.9b).

In contrast to the previous *Revision*, which employed a composite survival pattern representing the two sub-groups of children labelled "fast progressors" and "slow progressors", this *Revision* models these two groups separately (figure VI.8). In the current model, about 58 per cent of all infected children follow the fast progression schedule (labelled "AIDS/HIV++" in figure VI.8). They will die early and are therefore not considered eligible for ART treatment. Children that follow the slow progression schedule (about 42 per cent of all infected children) have a longer incubation period and will enter stage 4 on average after 12.1 years after birth. In stage 4 of the disease, children become eligible for treatment. Infected children that receive treatment (labelled "AIDS/ART" in figure VI.8) survive on average another 19.5 years. Those reaching stage 4 of the disease who do not receive ART treatment will survive on average 2 years. The modified modelling of paediatric HIV/AIDS also results in infected children entering the adult ages (assumed in this model to begin at age 15), whereas in the previous *Revision* none of the infected children survived past age 15. As in the previous *Revision*; survival probabilities are the same for the male and female child.

Step 6: *Projecting the population that is not infected by HIV*

The previous steps describe how the HIV-positive population is projected from the start of the epidemic onward. In fact, the full multi-state projection procedure projects also the non-infected population allowing for two possible and independent ways of leaving that group: (*a*) by dying from non-AIDS causes, or (*b*) by becoming infected with HIV (i.e., the yearly incidence).

Step 7: *Calculation of revised life-tables that reflect the impact of HIV/AIDS*

The results of the multi-state projections permit the calculation of life tables that reflect both the effect of general mortality and the added impact of HIV/AIDS in a manner consistent with what is known about HIV prevalence in each country. The life tables representing average mortality for five-year periods are then used to carry out the "normal" population projections over five-year periods prepared by the Population Division for countries affected by the epidemic. That is, the mortality projection procedure ultimately used is the same for countries that are not yet affected significantly HIV/AIDS and those

[2] As a simplifying assumption, all infections through breast-feeding, e.g. after birth, are also anchored to the time of birth.

severely affected by the epidemic. This approach allows it to easily "splice" population projections for periods before the start of the epidemic with those after its start. It also allows to create "No-AIDS" versions of the population projections that represent estimated population dynamics in the absence of HIV/AIDS.

Figure VI.9a. Survival distributions for children, stages 1-3

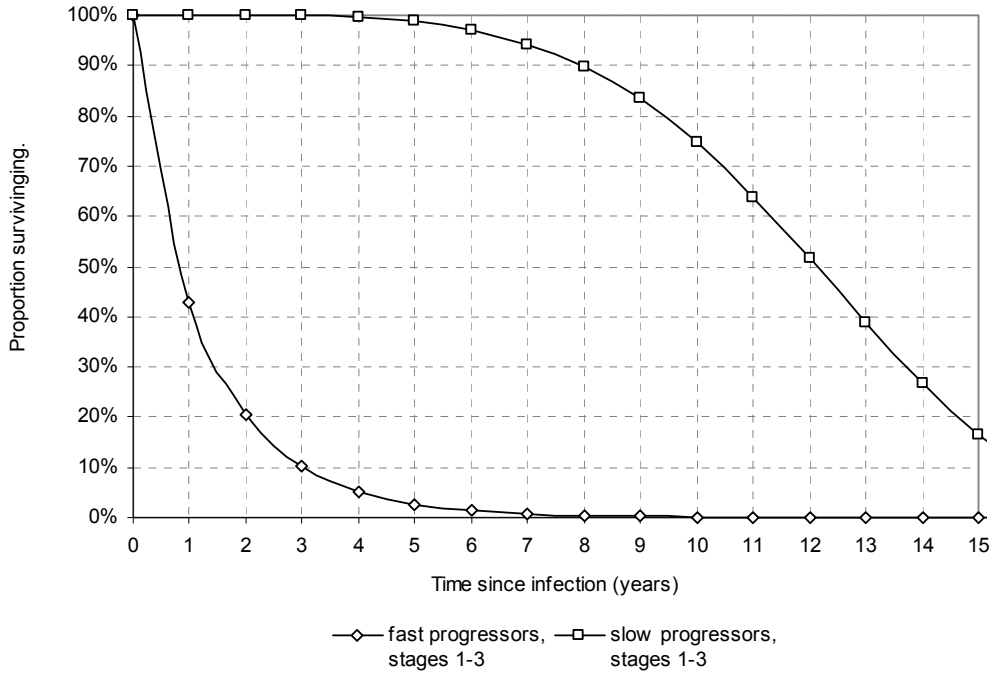
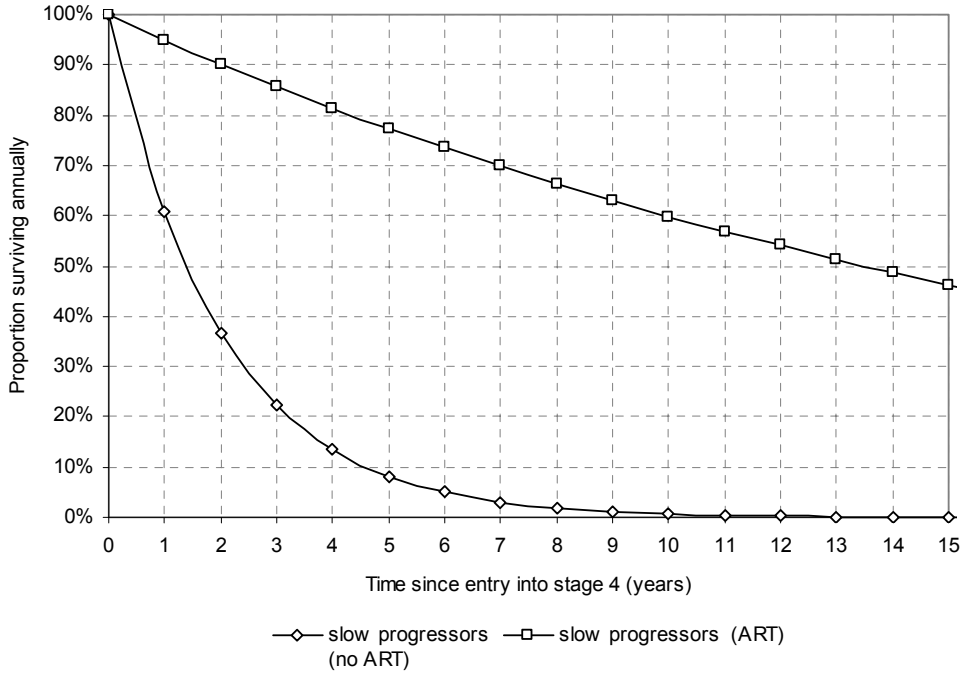


Figure VI.9b. Survival distributions for children, stage 4



D. THE PROJECTION OF INTERNATIONAL MIGRATION

International migration is the component of population change most difficult to project. This is primarily due to the fact that data on past trends are often sparse or incomplete, and because the movement of people across international borders, which is often a response to rapidly changing economic, social, political and environmental factors, is a very volatile process. Not only has international migration shown drastic changes in absolute numbers, but the direction of the flows has changed as well. As discussed in more detail in chapter 5, immigration countries have in the past often become emigration countries or vice versa. Therefore, formulating assumptions of future trends must focus on dominant past trends that are then kept constant throughout the projection period.

When a person moves from one country to another, that person is an emigrant when leaving the country of origin and becomes an immigrant when entering the country of destination. Because immigration and emigration flows affect countries differently, international migration is ideally studied as the flow of people moving between countries. In practice, data on international migration flows do exist only for a small number of countries. Therefore, international migration in this *Revision*, as in previous ones, has been captured as net migration. Net migration - the difference between the number of immigrants and the number of emigrants for a particular country and period of time - shows the net effect of international migration on the respective population. It does not provide an indication about the number of immigrants and emigrants involved. In an extreme case, immigration and emigration for a country could be significant, but if the number of immigrants was equal to the number of emigrants, net migration would amount to zero.

In preparing assumptions about future trends in international migration, several pieces of information were taken into account: (*1*) information on net international migration or its components (immigration and emigration) as recorded by countries; (*2*) data on labour migration flows; (*3*) estimates of undocumented or irregular migration; (*4*) and data on refugee movements in recent periods.

The basic approach for formulating future international migration assumptions is straight-forward. For any given country, a distinction is made between international migration flows and movement of refugees. For international migration, it is assumed that recent levels, if stable, continue throughout the projection period. Government's views on international migration as well as estimates of undocumented and irregular migration flows affecting a country are also considered (see, for example United Nations, 2003). Regarding the movements of refugees, it is assumed in general that refuges return to their country of origin within the next one or two projection periods, or within 5 to 10 years. If a country experiences both international migration and refugee movements, the two processes are added in order to capture to overall net migration during a particular period in the future.

Usually, migration assumptions are expressed in terms of net number of international migrants. Their distribution by sex is established on the basis of what is known about the participation of men and women in different types of flows for any given country (e.g. labour migration, family reunification, etc). Given the lack of suitable information on the age distribution of migrant flows, models are generally used to distribute the overall net number of male and female migrants by age group according to the dominant type of migration flow assumed (i.e., labour migration, family migration). These age and sex profiles of the net migration flows are then used as input for the cohort-component projection model (United Nations 1988, pp 65-70). For few countries with a known age and sex distribution of international migrants, those distributions were used to determine which model is most suitable or, in some cases, they were used directly as input. The distribution of net migrants by age and sex was generally kept constant over the projection period. However, if a country was known to attract temporary labour migrants, an effort was made to model the return flow of those labour migrants accounting for aging of the migrants involved. The same idea was applied to refugee flows.

International migration has become a universal phenomenon affecting countries all over the world. For countries known not to admit international migrants and known not to be the source of a sizeable number of migrants, net migration was set to zero during 2005-2050. In fact, 15 of 192 countries were assumed to have zero net migration over the projection period. For an additional 10 countries migration was assumed to become zero some time during 2005-2025. Most countries in this category were countries affected by refugee flows. In general, refugees who had found asylum in less developed countries were assumed to return to their countries of origin by 2010-2015. Hence, net migration for host countries of refugees was assumed to differ from zero in 2010-2015 but was set to zero after 2015.

The remaining 167 countries were projected to experience non-zero net international migration during the entire projection period. Among these 167 countries 58 were projected to be receiving countries with positive net flows, while 109 countries were projected to be sending countries with negative net flows.

E. THE PREPARATION OF POPULATION PROJECTIONS

1. Projection methods

The Population Division has employed the cohort-component projection method for individual country projections since the *1963 Revision*. This method, the most commonly projection method used by demographers, provides an accounting framework for the three demographic components of change: births, deaths and international migration and relates them to the population affected. Technically, it is not a projections method, as it requires the components of change - births, deaths, migration - to be projected in advance. Rather, it is a calculation device that describes how to combine the demographic components arithmetically such that correct results are obtained. At its core, the cohort component method follows people in a certain age group at a certain point in time as they survive n years and are n years older. During a projection interval of n years, deaths occurring to that group of people are subtracted and international migration is added or subtracted, depending on the direction of the migration. Births that occur during a projection period are also exposed to the risk of deaths and then added as the youngest age group. A formal description of the mathematics of the cohort-component method can be found in Preston, Heuveline and Guillot (2001); it is not repeated here.

The cohort component method is applied for all 229 countries or areas included in this *Revision*. Detailed results are published for 195 large countries, e.g. countries with 100,000 or more inhabitants in 2007. For the 34 countries that fell below that threshold only total population and growth rates are made available.

2. Variants and scenarios

The *2006 Revision* includes eight projection variants and three AIDS scenarios. The eight variants are: low; medium; high; constant-fertility; instant-replacement-fertility; constant-mortality; no change (constant-fertility and constant-mortality); and zero-migration.

The first five variants, namely, the low, medium, high, constant-fertility and instant-replacement-fertility, differ among themselves exclusively in the assumptions made regarding the future path of fertility. The high, low and constant-fertility variants differ from the medium variant only in the projected level of total fertility. In the high variant, total fertility is projected to approach a fertility level that is 0.5 children above the total fertility in the medium variant. For example, countries reaching a total fertility of 1.85 in the medium variant reach a total fertility of 2.35 in the high variant. In the low variant, total fertility is projected to remain 0.5 children below the total fertility in the medium variant. In the constant-fertility variant, total fertility remains constant at the level estimated for 2000-2005. In the instant replacement variant, fertility for each country is set to the level necessary to ensure a net reproduction rate of 1.0 starting in 2005-2010. Fertility varies slightly over the projection period in such a way that the net reproduction rate always remains equal to unity thus ensuring, over the long-run, the replacement of the population.

The sixth variant, named "constant-mortality", differs from the medium variant only with regard to the path followed by future mortality. The seventh variant, denominated "no

change", has constant mortality and constant fertility and thus differs from the medium variant with respect to both fertility and mortality. The eight variant, denominated "zero-migration", differs from the medium variant only with regard to the path followed by future international migration. Generally, variants differ from each other only over the period 2005-2050.

In addition, the *2006 Revision* includes three AIDS scenarios named No-AIDS, high-AIDS and AIDS-vaccine. These scenarios are variations of the medium variant and differ from each other and from the medium variant in terms of the path mortality follows because they each incorporate different assumptions regarding the course of the HIV/AIDS epidemic. Note that only 62 countries are considered to be significantly affected by the epidemic. Consequently, the AIDS scenarios produce different projections only for those countries.

The various projections variants and scenarios are made available, in varying degree of completeness, on three CD-ROMs (see order form).

3. Interpolation procedures

The cohort-component method requires a uniform age format for the population and the vital events, usually single-year or five-year age groups. For the purpose of global population estimates and projections, most data are only available in five-year age groups. As a consequence, all results produced by the cohort-component method are also in five year age groups and, for vital events, represent five year periods. Life expectancy, for instance, is given as the average over the five-year period from mid-2000 to mid-2005. However, users of the estimates and projections often need to have demographic information for single calendar years or for single year-age-groups. In those cases, it is customary to apply special interpolation routines to produce such indicators. It must be noted, however, that interpolation procedures cannot recover the true series of events or the true composition of an aggregated age group. All these procedures can do is to provide the user with a smooth, reasonable and internally consistent annualized estimate of the indicator under consideration.

a. Interpolation of populations by age and sex

The basis for the calculation of interpolated population figures by single years of age and for each calendar year are estimated and projected quinquennial population figures by five-year age groups and sex. Interpolation into annual population figures is carried out by applying Beers ordinary formula (Siegel and Swanson, 2004, p.728). This interpolation procedure generates a smooth interpolated series of figures while maintaining the original values. The interpolation of five-year age groups into single year age groups is carried out by applying Sprague's fifth-difference osculatory formula (Siegel and Swanson, 2004, p. 727) for subdivision of groups into fifths. It should be noted that for ages above 80 and for age under five, the stability and reliability of the interpolation procedure is not always satisfactory.

b. Interpolation of vital events and summary statistics

For the interpolation of vital events, their rates and other measures into annualized times series, the modified Beers formula was used (Siegel and Swanson, 2004, p. 729). This formula combines interpolation with some smoothing. Beers modified methods is to be preferred over Beers "ordinary" formula as it avoids fluctuations at the beginning and the end of the series that are not typical for the variables concerned.

The time periods in the estimates and projections of this *Revision* are anchored to mid-year. Each observation or projections period starts at 1 July of a particular year and ends at mid-year five years later. Therefore, the annualized interpolated indicators refer to the period between the mid-year points of two consecutive calendar years. In order to provide annualized variables that refer to calendar years, an adjustment is made that simply assumes that the arithmetic average between two such periods will be a good representation of the calendar year based indicator.

4. Tabulations

Once the individual country projections are prepared, the results are aggregated into the

world, regions, major areas, development groups and other aggregates. For a list of the aggregation units see the explanatory notes.

The aggregation of populations by age and sex and vital events by age and sex is performed by simply adding the variables according to lists that assign individual countries to the aggregates. For synthetic variables, like life expectancy, total fertility, median age or net reproduction rates, proper population weighted averages are calculated.

Finally, after estimates and projections for all countries are performed and aggregated, it is necessary to ensure that the sum of all international migration adds to zero at the global level. This is achieved by an iterative process in which individual country projections are re-visited and altered accordingly.

F. ANNEX

This appendix contains the detailed information about the various models used for estimating and projecting demographic components, namely the models of fertility decline, of mortality improvement, and especially the mathematical model of the HIV/AIDS epidemic.

1. Fertility

a. Models of fertility decline

Since the *2002 Revision*, the models of fertility decline are formulated as rates of change/decline given a certain level of fertility. The empirical bases for these models are the fertility estimates for 1950-2000 from the *2000 Revision*. Only countries where there has been a fertility decline were considered, and only those periods after the decline had started were taken into account.

The tabulated values (level of fertility paired with associated fertility decline) were then rearranged into groups of Total Fertility spanning intervals of 0.5 child. The average number of children per woman in each 5-year period between 1950 and 2000 across all countries of the world varied between 1.1 and 8.5 children per woman. Grouping the many individual trends into groups with similar trends resulted in 3 models of fertility decline as explained in VI.b.1a which were fitted using two logistic functions. A logistic function exhibits an s-shape and describes a diffusion process growing from an initial level to an upper or lower asymptote.

The general form of a logistic can be expressed as

$$P(t) = \frac{k}{1 + \exp[-\alpha(t - \beta)]} \qquad (1)$$

k Saturation level or asymptote of the diffusion process
α Growth rate of the s-curve
β Length of time the curve takes to reach the midpoint of the growth trajectory

For modelling purposes, a re-parameterised logistic function is sometimes used (Meyer, 1994; Meyer, Young Ausubel, 1999), with easier to interpret parameters:

$$P(t) = \frac{k}{1 + \exp[-\frac{Ln(81)}{\Delta t}(t - t_m)]} \qquad (2)$$

t_m Midpoint of the growth/diffusion process

Δt Duration for the growth process to proceed from 10 per cent to 90 per cent of the asymptote (k)

This function relates to the general form by substituting

$$\beta = t_m$$

$$\Delta t = \frac{\ln(81)}{\alpha}.$$

As discussed earlier (VI.B), the process of fertility decline consists of two phases: a first phase of accelerating rates of decline that is followed by a second phase of slowing rates of decline. Such a two-phase process can be modelled by two logistic functions, one approaching an upper limit and a second one that approaches a lower limit.

$$P(t) = \frac{k_1}{1+\exp[-\frac{Ln(81)}{\Delta t_1}(t-t_{m1})]} + \frac{k_2}{1+\exp[-\frac{Ln(81)}{\Delta t_2}(t-t_{m2})]} \quad (3)$$

Table VI.3 presents the parameters of the three models used in this *Revision* for projecting annual fertility decline for total fertility above 1.85 children per woman. Figure VI.10 shows the composite curves of fertility decline for all three models.

TABLE VI.3. PARAMETERS OF THREE FERTILITY MODELS

Parameter	*Slow/Slow*	*Fast/Slow*	*Fast/Fast*
k_1	-0.113	-0.161	-0.252
Δt_1	5.028	4.341	4.0146
t_{m1}	5.769	5.064	5.167
k_2	0.148	0.220	0.313
Δt_2	2.754	3.023	4.317
t_{m2}	3.212	3.523	3.941

At a given total fertility (*TF*) level of 5 children per woman in year *t* for example, the Fast/Slow model of fertility decline implies that fertility will decline will decrease between year *t* and *t+1* of 0.12 child per woman (from 5.00 to 4.88), then the following year from 4.88 to 4.76, and so on. The annual decrement varies according to the new total fertility computed for each year, and of course, depending on the fertility model used. The annual decline in total fertility is computed through the general formula (3) with TF corresponding to total fertility as in formula (4).

$$\Delta TF = \frac{k_1}{1+\exp[-\frac{Ln(81)}{\Delta t_1}(TF-t_{m1})]} + \frac{k_2}{1+\exp[-\frac{Ln(81)}{\Delta t_2}(TF-t_{m2})]} \quad (4)$$

Based on the result of formula (5), the total fertility in year *t+1* is expected to be equal to the total fertility in year *t* (TF=5) minus the annual decline computed for the Fast/Slow model (0.12): 5 – 0.12 = 4.88. The decline between year *t+1* and *t+2* is computed similarly using TF = 4.88 in formula (4), and so on for following years.

$$\Delta TF = \frac{-0.161}{1+\exp[-\frac{4.394}{4.341}(5-5.064)]} + \frac{0.220}{1+\exp[-\frac{4.394}{3.023}(5-3.523)]} = 0.12 \quad (5)$$

b. Models of age patterns of fertility

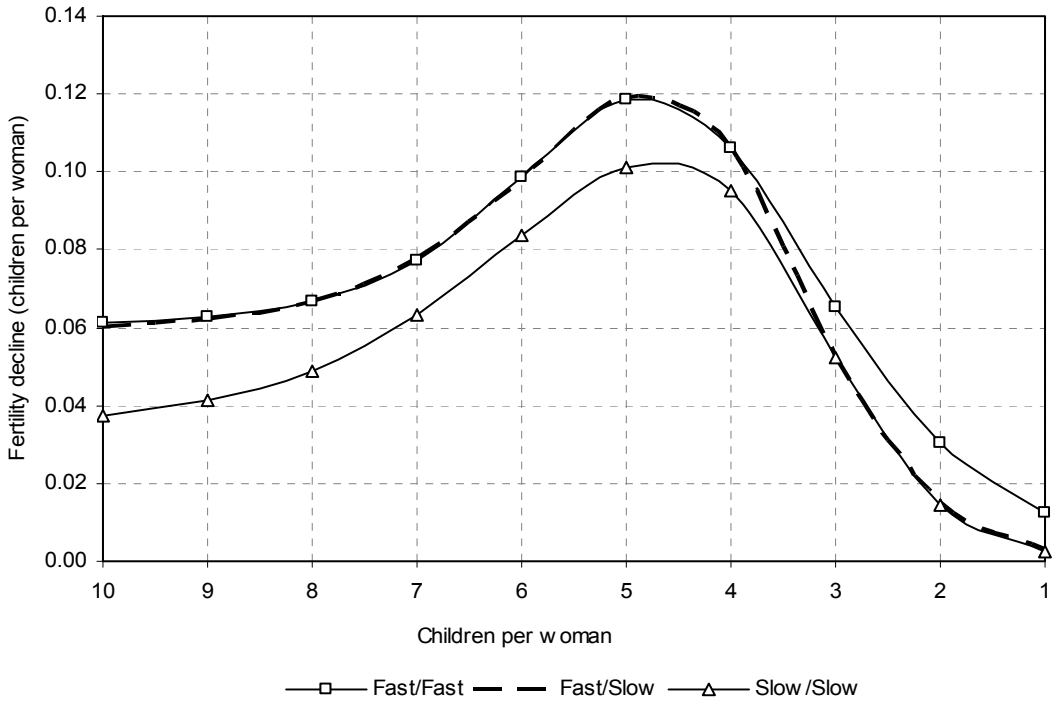
Model age patterns of fertility are presented as proportionate age-specific fertility, indexed by the mean age at childbirth. As explained above in section B.2.b, different model age patterns of fertility are used for countries high and medium-fertility levels (table VI.4a), market economy countries of Europe (table VI.4b) and countries with economies in transition (table VI.4c).

2. Models of general mortality improvement

Trends of mortality improvement are modelled as gains in life expectancy over a five-year period for a given range of life expectancy at the previous five-year period. Considering that the pace of improvement varies among populations, three different model of change (fast, medium, and slow) were initially developed in the 1980s and have been revised in 2004 to take into account two new trajectories (very fast and very slow). This new version provides now not only five models of change, but all models have been extended to life expectancies at birth varying from age 20 to 100 and have been parameterized using a bilogistic function allowing to easily compute annual gains in life expectancy at any exact value of life expectancy at birth.

The empirical bases for these models are the life expectancy estimates and projections by sex for all countries of the world (excluding AIDS countries) and 5-year periods from: (a) the *2002 Revision* for the periods 1950-2050, and (b) the

Figure VI.10. Models of fertility decline



latest UN long-range projections (*World Population to* 2300) extrapolating the *2002 Revision* mortality using the Lee and Carter (1992) method for the period 2050-2300. The tabulated values (life expectancy at birth paired with associated 5-year period average gains in life expectancy) were then rearranged into groups of life expectancy spanning intervals of 2.5 years. For the period 1950-2005, 5-year periods life expectancy at birth (excluding AIDS mortality) varied between 23 and 78 years for males, and between 25 and 85 years for females. For the projection period 2005-2300, male life expectancy is assumed to vary between 38 and 105 years, and between 41 and 108 years for females. From the statistical distribution of the average gains in life expectancy from 1950-2300 for all countries without AIDS mortality, five models of pace of change were defined for each sex (tables VI.5 and VI.6).

Average gains for 5-year period are shown in table VI.7 based on annual gains for each pace of improvement by sex calculated with the parameterized models in table VI.6.

As discussed in VI.C.1, pace of improvements in life expectancy at birth consists of two phases: A first phase of accelerating rates of improvement is followed by a second phase of slowing rates of improvement. Like for the fertility transition (see Annex F.1.a), this kind of two-phase process can be modelled by two logistic functions, where a first logistic function describes a diffusion process growing from an initial level to an upper one and a second logistic function depicts the transition from this upper level to a lower one (Meyer, 1994; Meyer, Young Ausubel, 1999).

For a given sex and model of mortality improvement, the average annual gain in life expectancy at birth (e0) according to an initial level of life expectancy (e0) can be represented as follows:

$$\Delta e_0 = \frac{k_1}{1+\exp[-\frac{Ln(81)}{\Delta t_1}(e_0 - t_{m1})]} + \frac{k_2}{1+\exp[-\frac{Ln(81)}{\Delta t_2}(e_0 - t_{m2})]} \quad (6)$$

TABLE VI.4a. MODEL FERTILITY SCHEDULES FOR HIGH AND MEDIUM-FERTILITY COUNTRIES

Model	Percentage of total fertility by age group							Total	Mean age at childbirth
	15-19	20-24	25-29	30-34	35-39	40-45	45-49		
1	18	49	23	8	2	0	—	100	24.0
2	16	46	28	8	2	0	—	100	24.3
3	9	43	31	12	4	1	—	100	25.6
4	7	44	29	15	5	1	—	100	26.0
5	11	37	29	17	6	1	—	100	26.2
6	5	39	34	15	6	1	—	100	26.6
7	12	30	31	18	8	2	—	100	26.7
8	5	37	34	17	6	1	—	100	26.8
9	12	28	33	19	7	1	—	100	26.8
10	3	34	36	18	7	1	—	100	27.3
11	1	28	48	19	4	1	—	100	27.5
12	1	24	55	17	3	1	—	100	27.5
13	2	27	42	20	7	1	—	100	27.9
14	5	23	38	24	10	2	—	100	28.3
15	2	23	40	24	9	2	—	100	28.5

TABLE VI.4b. MODEL AGE PATTERNS OF FERTILITY USED FOR THE MARKET ECONOMY COUNTRIES OF EUROPE

Model	Percentage of total fertility by age group							Total	Mean age at childbirth
	15-19	20-24	25-29	30-34	35-39	40-45	45-49		
1	2.2	22.9	43.2	26.2	5.2	0.2	0.0	100	28.0
2	1.5	17.5	40.4	31.4	8.7	0.6	0.0	100	29.0
3	1.0	13.2	36.3	35.3	13.0	1.3	0.0	100	30.0
4	0.6	9.8	31.6	37.6	17.9	2.5	0.0	100	31.0
5	0.4	7.2	26.7	38.1	23.0	4.5	0.1	100	32.0

TABLE VI.4c. MODEL AGE PATTERNS OF FERTILITY USED FOR THE COUNTRIES WITH ECONOMIES IN TRANSITION

Model	Percentage of total fertility by age group							Total	Mean age at childbirth
	15-19	20-24	25-29	30-34	30-39	40-45	45-49		
1	7.9	35.3	38.4	15.9	2.4	0.1	0.0	100	26.0
2	5.6	29.5	39.3	21.0	4.4	0.2	0.0	100	27.0
3	4.0	24.1	38.4	25.6	7.3	0.6	0.0	100	28.0
4	2.8	19.4	36.2	29.5	10.8	1.3	0.0	100	29.0
5	2.0	15.4	33.1	32.1	14.8	2.5	0.1	100	30.0

TABLE VI.5. EMPIRICAL BASIS FOR MODELS OF MORTALITY DECLINE

Pace of change in life expectancy	*Based on the average gains of...*
Very fast	Upper Decile
Fast pace	Upper Quartile
Medium Pace	Arithmetic Mean
Slow pace	Lower Quartile
Very slow	Lower Decile

TABLE VI.6. PARAMETERS OF FIVE MODELS OF ANNUAL GAINS IN LIFE EXPECTANCY AT BIRTH

	Very slow		*Slow pace*		*Medium Pace*		*Fast pace*		*Very fast*	
Parameter	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*
k_1	1.538	0.556	0.650	0.473	0.586	0.568	0.591	0.631	0.895	0.940
Δt_1	44.423	48.825	49.403	42.686	40.966	41.070	39.616	37.714	41.927	42.132
t_{m1}	51.643	46.250	43.750	36.015	36.250	33.750	31.250	31.250	38.779	38.649
k_2	-1.506	-0.512	-0.586	-0.414	-0.506	-0.491	-0.493	-0.534	-0.782	-0.831
Δt_2	38.751	26.857	25.234	19.160	19.819	17.605	16.063	16.140	20.158	28.515
t_{m2}	58.247	68.311	65.006	70.995	66.853	72.322	68.130	72.676	68.661	73.901

TABLE VI.7. MODELS FOR MORTALITY IMPROVEMENT. QUINQUENNIAL GAINS IN LIFE EXPECTANCY AT BIRTH ACCORDING TO INITIAL LEVEL OF LIFE EXPECTANCY

Initial life expectancy level (years)	*Very fast pace*		*Fast pace*		*Medium pace*		*Slow pace*		*Very slow pace*	
	Male	*Female*	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*
40.0-42.5	2.52	2.64	2.20	2.40	1.84	1.96	1.40	1.49	1.07	1.05
42.5-45.0	2.79	2.92	2.36	2.56	2.01	2.11	1.55	1.63	1.20	1.19
45.0-47.5	3.04	3.18	2.48	2.68	2.16	2.25	1.70	1.75	1.31	1.32
47.5-50.0	3.26	3.40	2.57	2.79	2.28	2.36	1.82	1.85	1.39	1.44
50.0-52.5	3.44	3.58	2.64	2.87	2.36	2.45	1.90	1.94	1.42	1.55
52.0.5-55	3.56	3.72	2.68	2.92	2.41	2.52	1.94	2.00	1.42	1.62
55.0-57.5	3.61	3.80	2.69	2.96	2.40	2.56	1.92	2.04	1.37	1.66
57.5-60.0	3.58	3.82	2.64	2.97	2.33	2.58	1.84	2.04	1.27	1.65
60.0-62.5	3.44	3.78	2.53	2.95	2.18	2.55	1.68	2.00	1.15	1.59
62.5-65.0	3.17	3.66	2.30	2.87	1.94	2.47	1.48	1.91	1.00	1.48
65.0-67.5	2.79	3.47	1.97	2.70	1.64	2.31	1.24	1.74	0.86	1.32
67.5-70.0	2.32	3.21	1.57	2.43	1.32	2.06	1.01	1.51	0.72	1.13
70.0-72.5	1.84	2.89	1.19	2.04	1.03	1.73	0.80	1.24	0.60	0.93
72.5-75.0	1.42	2.53	0.90	1.60	0.80	1.36	0.64	0.97	0.49	0.75
75.0-77.5	1.11	2.16	0.71	1.20	0.64	1.03	0.51	0.74	0.40	0.59
77.5-80.0	0.89	1.81	0.60	0.90	0.54	0.77	0.43	0.57	0.34	0.47
80.0-82.5	0.75	1.50	0.54	0.71	0.48	0.61	0.37	0.45	0.29	0.38
82.5-85.0	0.67	1.25	0.51	0.60	0.44	0.51	0.34	0.38	0.25	0.31
85.0-87.5	0.62	1.05	0.50	0.54	0.42	0.45	0.32	0.34	0.22	0.27
87.5-90.0	0.59	0.90	0.49	0.51	0.41	0.42	0.31	0.32	0.20	0.24
90.0-92.5	0.58	0.80	0.49	0.50	0.40	0.40	0.31	0.31	0.18	0.23
92.5-95.0	0.57	0.72	0.49	0.49	0.40	0.39	0.30	0.30	0.17	0.22
95.0-97.5	0.56	0.66	0.49	0.48	0.40	0.39	0.30	0.30	0.17	0.21
97.5-100.0	0.56	0.63	0.49	0.48	0.40	0.39	0.30	0.30	0.16	0.21

Figure VI.11.a. Models of annual gains in life expectancy at birth, males

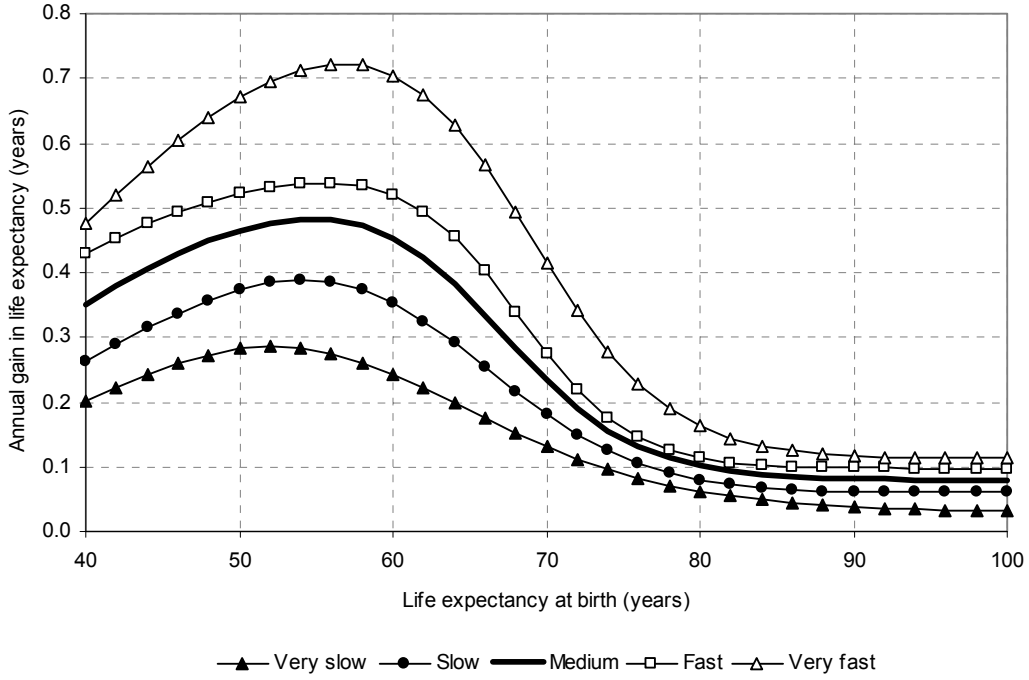


Figure VI.11.b. Models of annual gains in life expectancy at birth, females

Table VI.7 presents the parameters of the five models used in this *Revision* for projecting annual improvements in life expectancy at birth by sex. Figures VI.11a and VI.11b show the composite curves of gains in life expectancy at birth for all five models by sex.

At a given level of life expectancy at birth of 52 years in year *t* for example, the Medium model of mortality improvement implies for males that life expectancy will improve between year *t* and *t+1* of 0.48 year (from 52.00 to 52.48), then the following year by 0.47 year from 52.48 to 52.96, and so on. The annual increment varies according to the new life expectancy computed for each year, and of course depending of the model of mortality improvement used. After substituting in formula (6) the six parameters for the Medium model as given in Table VI.3, and with Ln(81) = 4.394449, the annual gain in life expectancy at birth (e0) for males having an life expectancy at birth of 52 years in year t can be computed as follows:

$$\begin{aligned}\Delta e_0 &= \frac{0.586}{1+\exp[-\frac{4.394}{40.966}(52-36.250)]} \\ &\quad + \frac{-0.506}{1+\exp[-\frac{4.394}{19.819}(52-66.854)]} \\ &= 0.48\end{aligned} \tag{7}$$

Based on the result of formula (7), the mortality improvement in year *t+1* is expected to be equal to the life expectancy at birth in year *t* (e0=52) plus the annual gain computed for the Medium model (0.48): 52 + 0.48 = 52.48. The improvement between year *t+1* and *t+2* is computed similarly using e0 = 52.48 in formula (6), and so on for following years.

3. Models of HIV/AIDS

a. Epidemiological model

The model used to derive annual estimates of incidence from observed prevalence levels is based on three differential equations representing the dynamics of the epidemic over time (UNAIDS Reference Group on Estimates, Modelling and Projections, 2002). The model divides the total adult population of persons over 15, denoted by *N*, into three groups:

1. Persons who, at time *t*, are not at risk of being infected by HIV, denoted by $X(t)$.
2. Persons already infected by HIV at time *t*, denoted by $Y(t)$;
3. Persons at risk of being infected by HIV at time *t* (the susceptible population), denoted by $Z(t)$,

The first differential equation indicates how the susceptible or at-risk population changes over time:

$$\frac{dZ(t)}{dt} = F\left(\frac{X(t)}{N(t)}\right)E(t) - \left[\mu + \frac{rY(t)}{N(t)} + \theta(t)\right]Z(t) \tag{8}$$

The second equation shows how the non-susceptible population (not at-risk population) changes over time:

$$\frac{dX(t)}{dt} = \left(1 - F\left(\frac{X(t)}{N(t)}\right)\right)E(t) - \mu X(t) \tag{9}$$

The third differential equation captures how the number of infected persons (Y) changes over time:

$$\begin{aligned}\frac{dY(t)}{dt} &= \left[\frac{rY(t)}{N(t)} + \theta(t)\right]Z(t) \\ &\quad - \int_0^t \left[\frac{rY(s)}{N(s)} + \theta(s)\right]Z(s)M(t-s)ds\end{aligned} \tag{10}$$

In order to start the epidemic in this model, an external pulse is required, implemented here as parameter $\theta(t)$. It is set to a positive value when the epidemic starts, and becomes zero thereafter.

The three sub-populations in this model are adult populations (age 15 and over), so they need to be connected to births to allow for the renewal of the population. $E(t)$ in formula 8 represents the number of individuals entering the population aged 15 or over at time t. $E(t)$ is therefore the number of persons reaching exact age 15 at time *t*. $E(t)$ can be estimated as:

$$E(t) = l(15, t-15)\, b(t-15) \\ *\left[X(t-15) + Z(t-15) + (1-\nu)\,\xi\, Y(t-15)\right] \quad (11)$$

where $l(15, t\text{-}15)$ is the probability of surviving from birth to age 15 among persons born at time t-15, $b(t\text{-}15)$ is the birth rate at time t-15, ν is the probability of HIV transmission from mother to child, and ξ is a factor reflecting the reduction of fertility among HIV positive women. The infected population Y at time t-15 is reduced by the transmission rate from mother to child and the fertility reduction factor, which is equivalent to assuming that no child born with HIV will survive to age 15.

Not all persons reaching age 15 are susceptible to being infected with HIV. The fraction that becomes part of the susceptible population is a function of the proportion of the population that is not susceptible and is defined as:

$$F\left(\frac{X(t)}{N(t)}\right) = \frac{\Omega\left(\frac{X(t)}{N(t)}\right)}{\left(\exp\left[\Phi\left(\frac{X(t)}{N(t)} - 1 + f_0\right)\right] - 1 + \frac{1}{f_0}\right)} \quad (12)$$

In formula 5, f0 is the fraction of individuals who entered the susceptible group at age 15 just as the HIV epidemic started:

$$f_0 = \frac{X(0)}{N(0)} \quad (13)$$

The parameter *Φ (Phi)* captures the recruitment of persons into the susceptible group. In addition, μ represents the mortality rate among the population not infected with HIV (the background mortality) and the rest of the expression in parenthesis represents the decrement of $Z(t)$ caused by the transfer of persons from the susceptible group to the group of those infected with HIV.

The parameter r represents the force of infection, that is, the probability that an interaction between an infected individual and a susceptible one results in the infection of the latter.

The integral in equation (3) represents the cumulative number of deaths among individuals infected by HIV since the start of the epidemic. The function $M(t)$ is the instantaneous probability of dying at time t by all causes (AIDS or other causes) and is given by:

$$M(t) = \left(\mu + \frac{\alpha\, t^{\alpha-1}}{\beta^{\alpha}}\right) \exp\left[-\mu t - \left(\frac{t}{\beta}\right)^{\alpha}\right] \quad (14)$$

That is, the probability of dying is modelled as a Weibull density function with shape parameter α and position parameter β. In equation (7), μ represents the force of mortality due to causes other than AIDS (background mortality).

With the model just specified, four essential parameters r, f_0, Φ, t_0 (the time of the start of the epidemic) are then estimated from the empirical prevalence data. All other information captured in the model is assumed to be known or is set to plausible values.

b. Models of adult HIV/AIDS

The age-specific infection pattern for the adult population has been parameterized as a Weibull function with the following parameters (table VI.8).

The net adult survival patterns describes the survival of an infected person from infection to the onset of full blown AIDS, that is from clinical stage 1 to clinical stage 3. It was modelled by a Weibull function, for each sex separately (table VI.9).

The survival of infected people depends on their access to effective treatment and the efficacy of that treatment. Table VI.10 lists treatment coverage and annual survival proportions for adults and children.

The net survival in clinical stage 4, that is, from the onset of full blown AIDS to death, is modelled by a Weibull function with parameters alpha and beta as shown in table VI.11.

TABLE VI.8. PARAMETERS FOR ADULT HIV INFECTION PATTERNS BY SEX

Parameter	*Males*	*Females*
Alpha	1.60	1.50
Beta	29.00	17.00
Median	38.60	28.31
Mean	41.00	28.31

TABLE VI.9. PARAMETERS FOR ADULT INCUBATION PERIOD BY SEX

Parameter	*Males*	*Females*
Alpha	3.10	3.31
Beta	8.95	9.59
Median	7.95	8.85
Mean	8.00	8.60

It should be noted that the above functions are equivalent to simple exponential functions, since the Weibull function becomes an exponential function when alpha is set to 1.0. In the practical implementation of the model in abcDIM, Weibull functions are used throughout abcDIM.

c. Models of paediatric HIV/AIDS

Survival of children infected at birth with HIV is modelled with two separate Weibull function, one for those infants that progress very fast from infection to full-blown AIDS (fast progressors), and another one for those that exhibit a slow progression paths to develop AIDS (slow progressors). Note that in previous Revisions, paediatric survival was modelled with a double Weibull function that had a fixed proportion between fast and slow progressors (Marston et al. 2005). In this Revision, the two groups are modelled separately, both using a Weibull function as in formula (15).

$$s(x) = 1 - \left[1 - \exp\left(-(\beta x)^{\alpha}\right)\right] \qquad (15)$$

Infected children that follow the slow progression schedule have a mean survival time of 12 years during stages 1 to 3 of the WHO staging model (table VI.12a) and, if untreated, of 2 years with full blown AIDS (table VI.12b). The mean survival time of slow progressing children increase significantly to another 19.5 years if they receive ART treatment (stage 4) (tables 12b). Together, slow progressing children exhibit a mean survival time of 14 years without treatment, but have a life expectancy of 31.5 years (12 years plus 19.5 years) if receiving treatment for their HIV infection.

Infected children that follow the fast progression schedule have a much shorter average life expectancy (mean survival time) of just 1.3 years (table VI.12a). Fast progressors are therefore immediately assigned to the final stage 4 of the WHO staging model.

TABLE VI.10. PARAMETERS FOR MODELLING THE EFFECTS OF TREATMENT

		Adults			Children		
		Antiretroviral treatment coverage		Proportion surviving annually	Antiretroviral treatment coverage		Proportion surviving annually[3]
	Country	2005	2015		2005	2015	
	Africa	Per cent		Per cent	Per cent		Per cent
1	Angola	6	70	90	3	70	95
2	Benin	33	70	90	0	70	95
3	Botswana	85	90	93	84	90	95
4	Burkina Faso	24	70	90	7	70	95
5	Burundi	14	70	90	17	70	95
6	Cameroon	22	70	90	4	70	95
7	Central African Republic	3	40	90	2	40	95
8	Chad	17	40	90	0	40	95
9	Congo	17	40	90	0	40	95
10	Côte d'Ivoire	17	40	90	5	40	95
11	Dem. Rep. of the Congo	4	40	90	0	40	95
12	Djibouti	16	70	90	2	70	95
13	Equatorial Guinea	0	40	90	0	40	95
14	Eritrea	5	40	90	2	40	95
15	Ethiopia	7	40	90	0	40	95
16	Gabon	23	80	90	19	80	95
17	Gambia	10	70	90	0	70	95
18	Ghana	7	40	90	2	40	95
19	Guinea	9	40	90	2	40	95
20	Guinea-Bissau	1	40	90	0	40	95
21	Kenya	24	70	90	11	70	95
22	Lesotho	14	40	90	11	40	95
23	Liberia	3	40	90	0	40	95
24	Madagascar	0	40	90	0	40	95
25	Malawi	20	40	90	8	40	95
26	Mali	32	40	90	0	40	95
27	Mozambique	9	40	90	3	40	95
28	Namibia	71	80	90	52	80	95
29	Niger	5	40	90	1	40	95
30	Nigeria	7	40	90	1	40	95
31	Rwanda	39	70	90	20	70	95
32	Sierra Leone	2	40	90	1	40	95
33	South Africa	21	40	90	18	40	95
34	Sudan	1	40	90	0	40	95
35	Swaziland	31	70	90	16	70	95
36	Togo	27	70	90	3	70	95
37	Uganda	51	80	90	13	80	95
38	United Republic of Tanzania	7	40	90	6	40	95
39	Zambia	27	70	90	13	70	95
40	Zimbabwe	8	40	90	4	40	95

[3] An annual survival proportion of 95 per cent translates into mean survival duration of 19.5 years with a median of 13.5 years.

TABLE VI.10. (*continued)*

Country	Adults: Antiretroviral treatment coverage 2005	Adults: Antiretroviral treatment coverage 2015	Adults: Proportion surviving annually	Children: Antiretroviral treatment coverage 2005	Children: Antiretroviral treatment coverage 2015	Children: Proportion surviving annually[4]
Asia						
1 Cambodia	36	80	90	0	80	95
2 China	25	50	90	0	50	95
3 India	7	50	90	0	50	95
4 Myanmar	7	50	90	0	50	95
5 Thailand	60	80	90	95	95	95
Europe						
1 Estonia	17	80	90	0	80	95
2 Moldova						
3 Russian Federation	5	50	90	0	50	95
4 Ukraine	7	50	85	0	50	95
Latin America and the Caribbean						
1 Bahamas	0	80	95	0	80	95
2 Barbados	95	100	90	0	100	95
3 Belize	31	80	90	8	80	95
4 Brazil	100	100	92	0	100	95
5 Dominican Republic	17	80	90	0	80	95
6 Guyana	50	80	90	14	80	95
7 Haiti	20	70	90	1	70	95
8 Honduras	35	80	90	0	80	95
9 Jamaica	56	80	90	47	80	95
10 Suriname	55	80	90	0	80	95
11 Trinidad and Tobago	38	80	90	0	80	95
Northern America						
1 United States of America	99	99	90	99	99	95
Oceania						
1 Papua New Guinea	15	40	90	0	40	95

TABLE VI.11. PARAMETERS FOR SURVIVAL FROM FULL-BLOWN AIDS TO DEATHS, BY TREATMENT STATUS

Parameter	No treatment	Annual survival with ART treatment: 85 per cent	90 per cent	92 per cent	93 per cent	95 per cent
Alpha	1.00	1.00	1.00	1.00	1.00	1.00
Beta	2.00	6.20	9.50	12.00	13.8	19.5
Median	1.39	4.30	6.58	8.32	9.57	13.52
Mean	2.00	6.20	9.50	12.00	13.8	19.5

[4] An annual survival proportion of 95 per cent translates into mean survival duration of 19.5 years with a median of 13.5 years.

TABLE VI.12a. PARAMETERS FOR CHILD SURVIVAL FUNCTIONS, STAGES 1-3

Parameter	*Fast progressors*	*Slow progressors*
Shape parameter α[1]	..	4.50
Position parameter β[2]	..	0.08
Median (years)	..	12.12
Mean (years)	..	12.00

TABLE VI.12b. PARAMETERS FOR CHILD SURVIVAL FUNCTIONS, STAGE 4.

Parameter	*Fast progressors No treatment*	*Slow progressors No treatment*	*Slow progressors With treatment*
Shape parameter α[1]	0.90	1.00	1.00
Position parameter β[2]	0.83	2.00	19.51
Median (years)	0.80	1.39	13.51
Mean (years)	1.26	2.00	19.50.

[1] The shape parameter is denoted λ in Marston et al, 2005.
[2] The position parameter is denoted with μ in Marston et al, 2005.

VII. SOURCES OF DATA AND DEMOGRAPHIC METHODS

In preparing the 2006 Revision of the official United Nations population estimates and projections, the Population Division considered the most recent demographic data available for each and every country and area of the world. Standard demographic techniques were used to estimate the population by age and sex for the base year (2005) as well as trends in total fertility, life expectancy at birth, infant mortality and international migration up to 2006. The resulting estimates provided the basis for the population projections. A full description of the methodology used in deriving the population projections can be found in chapter VI.

This chapter presents, for each country and area, a brief description of the data sources and demographic methods used to make the base-year estimates for each country or area. Sources of data and methods are given for every country and area of the world, although for those with a population of fewer than 100,000 inhabitants in 2007, information is provided for the total population only. These descriptions assume that the reader has knowledge of the types of data and methods employed by demographers to obtain population estimates and refer to those data types and methods using the most widely recognized demographic terminology. An in-depth description of these methods can be found in previous United Nations publications (United Nations, 1982, 1983, 1988a, 1988b and 1990).

The annual editions of the Demographic Yearbook as produced by the United Nations Statistics Division, which collects on a regular basis demographic data from the national statistics offices of the world, were widely used in the production of the World Population Prospects. Official government estimates as well as those encountered in the different national census reports also constitute a crucial source of information in the production of the demographic time-series.

Surveys are often the source of the most recent demographic information for developing countries. Since the 1970s, there have been several multi-national survey programmes whose results provide key information about fertility or mortality in a number of countries. For the period from 1972 to 1984, the World Fertility Survey (WFS) programme, the predecessor of the current Demographic and Health Surveys Programme (DHS), has been an important source of information for the estimates included in the 2006 Revision. The DHS, which started in 1984 and under whose auspices close to 220 surveys have been carried out in more than 75 countries in Africa, Asia, Latin America and the Caribbean and parts of Europe, has proven to be an important source of information. The key results of the surveys conducted under the DHS Programme are normally published in national reports. In addition, special tabulations of the survey data are available in most cases. When any of those sources of information was consulted in preparing the population estimates and projections for a country, the text below states the name of the country, the acronym DHS and the year to which the survey refers. National reports as well as any other data emanating from the DHS surveys can be obtained from ORC Macro, the institution coordinating the survey programme.[1] It should be noted that several countries use different names or acronyms for their national reports and that in a few cases, countries have produced so-called Demographic and Health Surveys without the direct collaboration of ORC Macro.

Another survey programme has been the Pan Arab Project for Child Development (PAPCHILD) of the League of Arab States, working in collaboration with several international agencies. Its purpose was to gather information on the determinants of maternal and child health in Arab countries. The main results of the PAPCHILD surveys are normally included in national reports published by the countries undertaking such survey. In the present volume, when results of such surveys were used in preparing the population estimates and projections of a country, they are identified by the name of the country, the acronym PAPCHILD and the year to which the survey refers. The Pan Arab Project for Family Health

(PAPFAM)[2] and Gulf Family Health Survey (GFHS) continue the task initiated by the PAPCHILD programme.

During the 1990s, UNICEF embarked on a process of helping countries assess progress for children at end-decade in relation to the World Summit for Children goals, held in 1990 (see UNICEF, 1991). Since then, two rounds of Multiple Indicator Cluster Surveys have been carried out (MICS and MICS-2) that collected and estimated, inter alia, information on infant and child mortality and a third round (MICS-3) is underway. The mid-decade assessment led to 100 countries collecting data using the Multiple Indicator Cluster Surveys (MICS), household surveys developed to obtain specific mid-decade data, or via MICS questionnaire modules carried by other surveys. By 1996, 60 developing countries had carried out stand-alone MICS and another 40 had incorporated some of the MICS modules into other surveys. In the second phase of their data collection process, the so-called end-decade assessment, the list of countries participating in the programme was extended. By 2005, MICS-3 has expanded its scope in its third round to collect 21 of the 48 Millennium Development Goals (MDGs) indicators and to serve as monitoring tool for the World Fit for Children, as well as for other major international commitments, such as the UNGASS on HIV/AIDS and the Abuja targets for malaria3.

Finally, in preparing the 2006 Revision, demographic information as produced by other United Nations agencies or bodies, such as the Economic and Social Commissions for Asia and the Pacific (ESCAP), for Latin America and the Caribbean (ECLAC/CELADE) and for Western Asia (ESCWA), as well as the United Nations High Commissioner for Refugees (UNHCR), the United Nations Children's Fund (UNICEF) and the World Health Organization (WHO), was also used or considered. Data from regional organizations such as the Statistical Office of the European Communities (EUROSTAT), the Institut National de la Statistique et des Études Économiques (INSEE) and the Centre d'Études et de Recherche sur la Population et le Développement (CERPOD), have also been consulted.

AFGHANISTAN

Total population (2005): Estimated to be consistent with the 1979 census adjusted for underenumeration, with the structure by age and sex from the 2003 Afghanistan Multiple Indicator Cluster Survey (MICS-2) and the 2004 Afghan pre-census results, as well as with intercensal estimates of the trends in fertility, mortality and international migration. There is considerable uncertainty about the size of the population in 1979 because the census enumerated only the settled population and the number of nomads, reported to be of about 2 million at the time, is not exactly known.
Total fertility: Based on: (a) births in the preceding 12 months to the 1979 census classified by age of mother and (b) data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 1972-1973 Afghanistan Demographic Survey as well as the 2000 and 2003 Afghanistan MICS. Reproductive health studies conducted in Afghan refugee settlements in Pakistan were also considered.
Infant and child mortality: Based on: (a) data on births and infant deaths in the past 12 months from the 1979 census, adjusted for underreporting; (b) data on children ever born and surviving produced by the 1972-1973 Afghanistan Demographic Survey as well as the 1997, 2000 and 2003 Afghanistan MICS (adjusted for underreporting); and (c) estimates from UNICEF.
Life expectancy at birth: Based on: (a) a life table, derived from adjusted deaths in the past 12 months by age and sex and the population by age and sex from the 1979 census and (b) derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables.
International migration: Based on UNHCR statistics on the number of Afghan refugees in the main countries of asylum (Pakistan, India and Iran) and on assumptions about the subsequent return of refugees.

ALBANIA

Total population (2005): Estimated to be consistent with the 2001 census, with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2001.
Infant and child mortality: Based on data on children ever born and surviving from the 2000 Albania Multiple Indicator Cluster Survey (MICS-2).
Life expectancy at birth: Based on a life table for 2000-2001 derived from registered deaths by age and sex, observed trends in infant and child mortality and data from Census 2001.
International migration: Based on: (a) estimates of immigration of Albanians to Greece, Italy and the rest of Europe and (b) the difference between overall population growth and natural increase during the intercensal period.

ALGERIA

Total population (2005): Estimated to be consistent with the 1998 census, with official population estimates for 2003 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility derived from births registered from 1990 to 2001.
Infant and child mortality: Based on births and infant deaths registered through 2001. Estimates from 1998 to 2001 were revised by the National Statistical Office of Algeria. Estimates from the 2000 Algeria MICS and UNICEF were also taken into consideration.
Life expectancy at birth: Based on official estimates of life expectancy derived from the number of deaths registered through 2001. Female estimates during the 1990s were slightly adjusted upwardly.
International migration: Based on data on the number of Algerians admitted by France, on estimates of emigration of Algerians to other Arab countries and on UNHCR statistics on the number of refugees in Algeria.

AMERICAN SAMOA

Total population (2005): Estimated to be consistent with the 2000 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on an application of the P/F ratio method to data on children ever born and births during the year preceding the 2000 census.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 2000 census.
Life expectancy at birth: Based on: (a) the estimated level of infant and child mortality; (b) tabulations of parental survivorship (orphanhood) by age of respondent from the 2000 census; and (c) by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1990-2000 intercensal period.

ANDORRA

Total population (2005): Estimated to be consistent with 2000 and 2004 official population estimates and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on estimates of total fertility from 2000 to 2003.
Infant and child mortality: Based on estimates from UNICEF.
Life expectancy at birth: Based on estimates of life expectancy produced by WHO for 2000-2003.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase.

ANGOLA

Total population (2005): Estimated to be consistent with the 1970 census adjusted for underenumeration, with an official 1992

population estimate and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on data on children ever born from the 1996 Angola Multiple Indicator Cluster Survey (MICS-1).
Infant and child mortality: Based on: (a) data from the 1996 and 2001 Angola Multiple Indicator Cluster Surveys (MICS-1 & 2) and (b) estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR. It is assumed that the refugees will return to their country of origin.

ANGUILLA

Total population (2005): Estimated to be consistent with the 2001 census and with estimates of the subsequent trends in fertility, mortality and international migration.

ANTIGUA AND BARBUDA

Total population (2005): Estimated to be consistent with the 2001 census, with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on estimates of total fertility through 2001.
Infant and child mortality: Based on estimates from UNICEF.
Life expectancy at birth: Based on estimates of life expectancy produced by WHO for 2000-2003.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase.

ARGENTINA

Total population (2005): Estimated to be consistent with the 2001 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on registered births classified by age of mother through 2001.
Infant and child mortality: Based on births and infant deaths registered through 2001.
Life expectancy at birth: Based on a life table for 2000-2001 derived from registered deaths through 2001 and the underlying 2001 census population.
International migration: Based on estimates of net international migration derived from border statistics, administrative records and 2001 census information.

ARMENIA

Total population (2005): Estimated to be consistent with the 2001 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on registered births classified by age of mother through 2004 and the 2000 Armenia DHS.
Infant and child mortality: Based on maternity-history data from the 2000 Armenia DHS.
Life expectancy at birth: Based on a life table derived from reported deaths by age and sex in 2001 and the 2001 census population, adjusted for underreporting of infant and child deaths.
International migration: Based on estimates of net international migration derived as the difference between overall population change and natural increase during the 1989-2001 intercensal period.

ARUBA

Total population (2005): Estimated to be consistent with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2000.

Infant and child mortality: Based on official estimates of infant and child mortality available through 2000.
Life expectancy at birth: Based on official estimates of life expectancy available through 2000.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase.

AUSTRALIA[4]

Total population (2005): Estimated to be consistent with the 2001 census, with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official registration data of births by age of mother through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2004.
Life expectancy at birth: Based on official estimates of life expectancy available through 2002-2004. The age pattern of mortality is based on an official life table that was calculated from death registrations of 2001 and the 2001 census population.
International migration: Based on reported number of long-term and permanent arrivals and departures by age and sex through 2004 and estimates derived as the difference between overall population growth and natural increase through 2005.

AUSTRIA

Total population (2005): Estimated to be consistent with the 1991 and 2001 censuses, official population estimates by age and sex for 2004 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2004.
Life expectancy at birth: Based on deaths registered through 1998 classified by age and sex and on the underlying population by age and sex and official estimates of life expectancy at birth through 2005.
International migration: Based on official numbers on net international migration flows through 2004 and officially assumed subsequent trends in international migration.

AZERBAIJAN

Total population (2005): Estimated to be consistent with the 1999 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2004 classified by age of mother, adjusted for underregistration to achieve consistency with the 1999 census.
Infant and child mortality: Based on data on children ever born and surviving from the 2000 Azerbaijan Multiple Indicator Cluster Survey and maternity-history data from the 2001 Reproductive Health Survey.
Life expectancy at birth: Based on deaths registered through 2002 classified by age and sex and on the underlying population by age and sex. Death rates were adjusted for underregistration. The age pattern of mortality is based on an official life table for 1990, adjusted for underregistration.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1989-1999 intercensal period.

BAHAMAS

Total population (2005): Estimated to be consistent with the 2000 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Births registered through 2003 were considered as well as an official estimate of total fertility for 2000 from the Statistical Office of the Bahamas.
Infant and child mortality: Based on estimates from UNICEF for 2005. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on a life table for 1990 derived from registered deaths by age and sex and the 1990 population by age and sex. Total deaths registered through 2003 were also

taken into account. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on estimates of net international migration since 1990 derived from inflow and outflow data during the year preceding the 1991 census and information on persons born in the Bahamas admitted by the United States of America.

BAHRAIN

Total population (2005): Estimated to be consistent with the 2001 census, with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2002 classified by age of mother.
Infant and child mortality: Based on births and infant deaths registered through 2001, adjusted for underregistration. The official life expectancy estimates were taken into account in order to make the adjustments.
Life expectancy at birth: Based on official estimates of life expectancy for the year 2001.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1991-2001 intercensal period.

BANGLADESH

Total population (2005): Estimated to be consistent with the age and sex distribution of the 2001 census (5% sample) and the 1991 and 1981 adjusted censuses, as well as with intercensal estimates of the trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data for 1997-1999 derived from the 1999-2000 Bangladesh DHS, 1998-2000 from the 2001 Bangladesh Maternal Health Services and Maternal Mortality Survey and the 2004 Bangladesh DHS.
Infant and child mortality: Infant mortality estimates are derived from the child mortality rates using the West model of the Coale-Demeny Model Life Tables and are consistent with national and UNICEF estimates. Child mortality estimates are based on data on births and deaths under-five calculated from maternity-history data of the 1993-1994 Bangladesh DHS for the period (1989-1993), the 2001 Bangladesh Maternal Health Services and Maternal Mortality Survey for the period (1999-2000) and the 2004 Bangladesh DHS for the period (1999-2003). Levels and trends since the mid-1980s are consistent with under-five mortality estimates based on the 2001 BMMS sibling history and data gathered from Matlab Health and Demographic Surveillance System up to 2002.
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables. Estimates are consistent with those provided by the Sample Registration System through 2001 and a life table for 1998-2000 calculated from sex and age-specific death rates from the 2001 Bangladesh Maternal Mortality Survey.
International migration: Based on data on persons originating in Bangladesh and migrating to selected developed countries, from the number of persons born in Bangladesh enumerated by the censuses of India and from information on the number of workers receiving clearances to work abroad.

BARBADOS

Total population (2005): Estimated to be consistent with the 1990 census, preliminary results from the 2000 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2000 and previous trends in fertility.
Infant and child mortality: Based on estimates from UNICEF through 2005 and infant mortality statistics published by the Research and Planning Unit of the Ministry of Finance and Economic Affairs though 2004. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables. Total deaths registered through 2002

were also considered. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1980-1990 intercensal period and assumed subsequent trends. Immigrants admitted to the United States were also considered.

BELARUS

Total population (2005): Estimated to be consistent with the 1999 census, with official population estimates for 1 January 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2004, adjusted by a factor of 1.25 to compensate for infant deaths omitted owing to the use of a definition of infant death that does not conform to international standards.
Life expectancy at birth: Based on official estimates of life expectancy available through 2005. The age pattern of mortality is based on official life tables through 2003. Both estimates incorporate an adjustment to infant mortality, as described below.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1989-1999 intercensal period.

BELGIUM

Total population (2005): Estimated to be consistent with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2004.
Life expectancy at birth: Based on official estimates of life expectancy available through 2004.
International migration: Based on official estimates of international migration by sex available through 2005.

BELIZE

Total population (2005): Estimated to be consistent with the 1991 census adjusted for underenumeration, the preliminary total population from the 2000 census, official estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2000, adjusted for underregistration and results from the 1999 Family Health Survey.
Infant and child mortality: Based on: (a) births and infant deaths registered through 2002, adjusted for underregistration; (b) the results from the 1999 Family Health Survey; and (c) child mortality estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the UN General model of the United Nations Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1991-2000 intercensal period and official estimates of foreign-born and emigrants from the 2000 census.

BENIN

Total population (2005): Estimated to be consistent with the 1992 and 2002 censuses and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 1992

and 2002 censuses and (b) maternity-history data from the 1996 and 2001 Benin DHS.
Infant and child mortality: Based on: (a) an analysis of the 1961 Demographic Survey; (b) the results of the 1981-1983 multi-round survey (Enquête Nationale Démographique); (c) estimates of child mortality obtained from maternity-history data from the 1996 and 2001 Benin DHS; and (d) estimates from UNICEF. Data from the 1992 and 2002 censuses were also considered. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the South model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1979-1992 and 1992-2002 intercensal periods and on information on the number of citizens of Benin enumerated in neighbouring countries.

BERMUDA

Total population (2005): Estimated to be consistent with the 2000 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on estimates of total fertility through 2000.
Infant and child mortality: Estimates are derived from the level of life expectancy by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables.
Life expectancy at birth: Based on official estimates of life expectancy available through 1991.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase.

BHUTAN

Total population (2005): Estimated to be consistent with the 2005 census and with estimates of the historical trends in fertility, mortality and international migration.
Total fertility: Based on estimates from the 1984 Demographic Sample Survey, the 1994 Health Sample Survey, the 2000 National Health Survey and the 2005 census.
Infant and child mortality: Infant mortality estimates are derived from the child mortality rates using the North model of the Coale-Demeny Model Life Tables. Child mortality estimates are based on the 1984 Demographic Sample Survey, the 1994 Health Sample Survey, the 2000 National Health Survey, the 2005 census and are consistent with national and UNICEF estimates.
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. Life tables based on adjusted annual deaths from the 1994 National Health Survey and the 2005 census were also considered.
International migration: Based on refugee statistics compiled by UNHCR.

BOLIVIA

Total population (2005): Estimated to be consistent with the 2001 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1994, 1998 and 2003 Bolivia DHS. Also considered were estimates derived from reverse projection of the 2001 census and from births in the last year and parity reports from the 2001 census.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 1988 Encuesta Nacional de Población y Vivienda, the 1989 Bolivia DHS, the 1992 census, the 1994, 1998 and 2003 Bolivia DHS. Direct estimates from the last two sources were also considered.

Life expectancy at birth: Based on a life table derived from: (a) data on maternal orphanhood for 1974-1981 from the 1988 Encuesta Nacional de Población y Vivienda (ENPV); (b) deaths by age and sex referring to 1991 from the 1992 census; (c) deaths by age and sex referring to 2000-2001 from the 2001 census; and (d) estimates of infant and child mortality. Direct estimates from the 2003 Encuesta Nacional de Demografía y Salud (ENDSA) were also considered.
International migration: Based on estimates of net international migration for the intercensal period 1992-2001 and taking into account the number of persons born in Bolivia and enumerated by other censuses in the Americas during the 2000 census round.

BOSNIA AND HERZEGOVINA

Total population (2005): Estimated to be consistent with the 1981 census, adjusted to show the de facto population, with official population estimates for 2002 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2002.
Infant and child mortality: Based on births and infant deaths registered through 2002 and child mortality estimates from UNICEF.
Life expectancy at birth: Based on official estimates of life expectancy for 1988-1989. The age pattern of mortality was derived from an official life table for 1988-1989.
International migration: Based on: (a) refugee statistics compiled by UNHCR and (b) estimates of net international migration derived as the difference between overall population growth and natural increase during the intercensal period.

BOTSWANA

Total population (2005): Estimated to be consistent with the 2001 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) official estimates of total fertility from the Central Statistics Office of Botswana derived from the 2001 and 1991 censuses; the 1991 census estimates were adjusted by applying the P/F ratio method and (b) maternity-history data from the 1988 Family Health Survey II.
Infant and child mortality: Based on: (a) official estimates and projections from the Central Statistics Office of Botswana; (b) estimates from the 2000 and 2003 Botswana Multiple Indicator Cluster Surveys (MICS); (c) estimates derived from the 1971, 1981, 1991 and 2001 censuses and (d) estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR, on data on the number of migrant workers in South Africa and on official estimates of net migration flows from the Central Statistics Office of Botswana.

BRAZIL

Total population (2005): Estimated to be consistent with the 2000 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) births registered through 2001 classified by age of mother; (b) data on fertility from the 1992, 1993, 1995, 1996 and 2001 Pesquisa Nacional por Amostra de Domicilios (PNAD) and (c) census information by age of mother.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 2000 census. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on a life table for 1999-2001 derived from: (a) registered births and deaths by age and sex for 1999-2001 (adjusted for underregistration by using the growth-balance equation method) and the 2000 census population by age and sex and (b)

estimates of infant and child mortality. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1980-2000 intercensal period and statistics on Brazilians living overseas.

BRITISH VIRGIN ISLANDS

Total population (2005): Estimated to be consistent with the 2001 census and with estimates of the subsequent trends in fertility, mortality and international migration.

BRUNEI DARUSSALAM

Total population (2005): Estimated to be consistent with the 2001 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2001 classified by age of mother.
Infant and child mortality: Based on births and infant deaths registered through 2000 and child mortality estimates from UNICEF.
Life expectancy at birth: Based on a life table derived from registered deaths by age and sex of the period 1993-1997 and the estimated underlying population.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1981-1991 intercensal period and assumed subsequent trends.

BULGARIA

Total population (2005): Estimated to be consistent with the 2001 census, with official population estimates for 31 December 2005 and with estimates of trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2005.
Infant and child mortality: Based on life tables available through 2003 from the Human Mortality Database and consistent with official estimates of infant mortality through 2005.
Life expectancy at birth: Based on official estimates of life expectancy available through 2005. The age pattern of mortality is based on a 2003 life table for the population of Bulgaria from the Human Mortality Database.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase through 2005.

BURKINA FASO

Total population (2005): Estimated to be consistent with the 1996 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on data on children ever born and births in the preceding 12 months, both classified by age of mother, maternity-history and completed family size data from the 1993 Burkina Faso DHS, the 1998-1999 Burkina Faso DHS and the 2003 Burkina Faso DHS.
Infant and child mortality: Infant mortality estimates are derived from the child mortality rates using INDEPTH Pattern 1 relational model (INDEPTH Network, 2004. INDEPTH Model Life Tables for Sub-Saharan Africa. Table 4.2, p. 24). Child mortality estimates are based on: (a) data on children ever-born and surviving classified by age of mother (and the South model of the Coale-Demeny Model Life Tables), (b) maternity-history data from the 1992-1993, 1998-1999 and 2003 Burkina Faso DHS and (c) estimates from UNICEF. Data for demographic surveillance sites (Nouna and Oubritenga) also considered. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Estimated with INDEPTH Pattern 1 relational model (INDEPTH Network, 2004. INDEPTH Model Life Tables for Sub-Saharan Africa. Table 4.2, p. 24) using two parameters: (1) direct and indirect estimates of child mortality and (2) adjusted estimates of adult mortality (45q15) derived from (a) recent household deaths data from the 1976, 1985 and 1996 censuses and the 1991 national demographic survey, (b) parental

orphanhood from the 1993 Burkina Faso DHS, (c) siblings deaths from the 1998-1999 and 2003 Burkina Faso DHS. Data from the 1978 rural Mossi survey and for demographic surveillance sites (Nouna, Oubritenga) were also considered. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).

International migration: Based on the stock of persons from Burkina Faso enumerated in Côte d'Ivoire, taking into account the results of the CERPOD migration surveys and incorporating estimates of refugee flows derived from UNHCR data.

BURUNDI

Total population (2005): Estimated to be consistent with the 1990 census and with estimates of the subsequent trends in fertility, mortality and international migration.

Total fertility: Based on maternity-history data for the preceding 20 years from the 1987 Burundi DHS.

Infant and child mortality: Based on a 1990-1995 life-table accounting for the high number of deaths due to the 1993 civil war. The 2000 Enquête Nationale d'Évaluation des Conditions de vie de l'Enfant et de la Femme has also been taken into consideration. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).

Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny model life tables and taking into account the number of deaths due to civil strife. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).

International migration: Based on refugee statistics compiled by UNHCR and assuming that the Burundian refugees abroad will return to Burundi during 2005-2010.

CAMBODIA

Total population (2005): Estimated to be consistent with the 1998 census adjusted for underenumeration, the 2004 population estimate based on 2003-2004 Cambodia Socio-Economic Survey and with estimates of the subsequent trends in fertility, mortality and international migration.

Total fertility: Based on maternity-history data from the 2000 and 2005 Cambodia DHS.

Infant and child mortality: Based on: (a) maternity-history data from the 2000 and 2005 Cambodia DHS and (b) data on children ever born and surviving from the 1998 census. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).

Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables. Official estimates from the 1998 Census were also taken into account. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).

International migration: Based on UNHCR data on movements of refugees between Cambodia and neighbouring countries, on assumed emigration levels and on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1998-2004 period.

CAMEROON

Total population (2005): Estimated to be consistent with the 1987 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.

Total fertility: Based on maternity-history data from the 1978 Cameroon WFS and the 1991, 1998, 2004 Cameroon DHS.

Infant and child mortality: Based on: (a) maternity-history data from the 1978 Cameroon WFS, the 1991, 1998 and 2004 Cameroon DHS; (b) data on children ever born and surviving from the 2000 Cameroon MICS; (c) child mortality estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).

Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has

been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR.

CANADA

Total population (2005): Estimated to be consistent with official population estimates for the mid-year 2005.
Total fertility: Based on births registered through 2003 classified by age of mother.
Infant and child mortality: Based on births and infant deaths registered through 2003.
Life expectancy at birth: Based on deaths registered through 2003 and the estimated population classified by age and sex.
International migration: Based on estimates of international migration through 2005. Adjustments were made in order to comply with the 1995, 2000 and 2005 official population estimates.

CAPE VERDE

Total population (2005): Estimated to be consistent with the 1990 and 2000 censuses and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1998 Demographic and Reproductive Health Survey and estimates of total fertility from the 2000 census.
Infant and child mortality: Based on data on children ever born and surviving from the 1998 Demographic and Reproductive Health Survey.
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables. An official estimate of life expectancy at birth by sex for 1990 was also considered.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1980-1990 and 1990-2000 intercensal periods.

CAYMAN ISLANDS

Total population (2005): Estimated to be consistent with the 1989 and 1999 censuses and with estimates of the subsequent trends in fertility, mortality and international migration.

CENTRAL AFRICAN REPUBLIC

Total population (2005): Estimated to be consistent with the 2003 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1994-1995 Central African Republic DHS and Based on data on children ever born classified by age of mother from the 2003 census.
Infant and child mortality: Based on maternity-history data from the 1994-1995 Central African Republic DHS. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR. The refugees in the Central African Republic in 2005 were assumed to leave the country by 2010-2015 and citizens of the Central African Republic recognized as refugees in countries of the region were assumed to return to their country by 2010-2015.

CHAD

Total population (2005): Estimated to be consistent with the 1993 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1996-1997 and 2004 Chad DHS.

Infant and child mortality: Based on: (a) maternity-history data from the 1996-1997 and 2004 Chad DHS; (b) data on children ever born and surviving from the 2000 Chad MICS; and (c) estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the South model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR and assumed levels of emigration. Refugees in Chad were assumed to leave the country by 2020.

CHANNEL ISLANDS[5]

Total population (2005): Estimated to be consistent with the 2001 census of Jersey and Guernsey and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on registered births classified by age of mother through 2000 for Guernsey and through 1994 for Jersey.
Infant and child mortality: Based on births and infant deaths registered through 2000 for Guernsey and through 1994 for Jersey.
Life expectancy at birth: Based on: (a) a life table for 1989-1993 derived from registered deaths by age and sex and the underlying population and (b) registered deaths through 2000 for Guernsey and through 1994 for Jersey.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1996-2001 intercensal period. National estimates were used for the period 2001-2004.

CHILE

Total population (2005): Estimated to be consistent with the 2002 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) births registered through 2002 classified by age of mother and (b) data from the 2002 census on births in the 12 months preceding enumeration classified by age of mother.
Infant and child mortality: Based on births and infant deaths registered through 2002 and in the 2002 census.
Life expectancy at birth: Based on a life table for 2000-2002 derived from registered deaths by age and sex for the period 2000-2002 and the population by age and sex from the 2002 census.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during each intercensal period and on foreign-born statistics in other countries. Statistics of Chileans living oversees from the 2000 census round were also considered.

CHINA

Total population (2005): Estimated to be consistent with the 2000 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1992 National Fertility Family Planning Survey and the adjusted number of births reported 12 months prior to the 2000 census.
Infant and child mortality: Based on official estimates from the Health Department and the National Bureau of Statistics, published data from secondary sources and child mortality estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on published life tables for the periods 1982-1990, 1990-2000 and 1999-2000. These life tables were calculated from the 1982, 1990 and 2000 census counts and the 1973-1975 Cancer Epidemiology Survey. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV)
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1982-1990

intercensal period and the number of international migrants admitted by the United States of America.

CHINA, HONG KONG SAR

Total population (2005): Estimated to be consistent with the 2001 census, official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility through 2005 provided by the Census and Statistics Department, Hong Kong SAR China.
Infant and child mortality: Based on births and infant deaths registered through 2004.
Life expectancy at birth: Based on deaths registered through 2004 classified by age and sex and on the underlying population by age and sex.
International migration: Based on estimates given in Hong Kong Population Projections: 2004-2033, Census and Statistics Department, Hong Kong SAR China and assumed subsequent trends in international migration.

CHINA, MACAO SAR

Total population (2005): Estimated to be consistent with the 2001 census, with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered in 2003-2005 classified by age of mother and on estimates of the female population by age.
Infant and child mortality: Estimates of infant mortality through 2005 were considered as well as other overall trends in mortality.
Life expectancy at birth: Based on official estimates of life expectancy derived from registered deaths through 2002.

International migration: Based on the inflow of legally admitted migrants, including legal immigrants from China, the number of foreigners authorized to reside in Macao SAR China through 2004 and the number of migrant workers. The number of migrants with illegal entry into Macao SAR China, legalized by the authorities during 1978 and 1991, was also taken into consideration as well as illegal immigrants repatriated over the 2001-2004 period.

COLOMBIA

Total population (2005): Estimated to be consistent with the 1993 census and with preliminary results from the 2005 census, adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) maternity-history data from the 1995, 2000 and 2005 Colombia DHS and (b) data on births in the preceding 12 months, classified by age of mother, from the 1993 census and preliminary results from the 2005 census.
Infant and child mortality: Based on: (a) maternity-history data from the 1995, 2000 and 2005 Colombia DHS; (b) births and infant deaths registered in 1992-1997; and (c) indirect estimates from the 1993 census.
Life expectancy at birth: Based on a life table for 1990-1995 derived from: (a) registered deaths by age and sex for 1990-1995 adjusted for underregistration by the growth-balance equation method and the 1993 census population by age and sex and (b) estimates of infant and child mortality. The 2005 DHS was also considered.
International migration: Based on the number of Colombians reported by the 1990 and 2000 censuses of Venezuela and the United States of America and on the difference between overall population growth and natural increase during each intercensal period.

COMOROS[6]

Total population (2005): Estimated to be consistent with the 2003 census of the three islands of the Comoros, with the 2002 census of Mayotte and with estimates of the subsequent trends in fertility, mortality and international migration. The age structure is based on the 1991 censuses of Comoros and Mayotte.
Total fertility: Based on: (a) data on children ever born and births in the preceding 12 months,

both classified by age of mother, from the 1991 census and (b) maternity-history data from the 1996 Comoros DHS.
Infant and child mortality: Based on maternity-history data from the 1996 Comoros DHS.
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables.
International migration: Based on information on migrants from the Comoros in Réunion.

CONGO

Total population (2005): Estimated to be consistent with the 1984 census and with estimates of the subsequent trends in fertility, mortality and international migration. The total population from the 1996 census was also taken into consideration.
Total fertility: Based on (a) data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 1974 and 1984 censuses and (b) maternity-history data from the 2005 Congo DHS.
Infant and child mortality: Based on: (a) estimates for the 1970s derived from 1974 census data on children ever born and surviving classified by age of mother and on similar estimates reported by the 1984 census and (b) maternity-history data and data on children ever born and surviving classified by age of mother from the 2005 Congo DHS. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR.

COOK ISLANDS

Total population (2005): Estimated to be consistent with the 2001 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2003 classified by age of mother.
Infant and child mortality: Based on births and infant deaths registered through 2003.
Life expectancy at birth: Based on a life table for 1996-2001 derived from the average number of registered deaths by age and sex of the years 1996-2001 and the estimated mid-period population by age and sex.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1996-2001 intercensal period.

COSTA RICA

Total population (2005): Estimated to be consistent with the 2000 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2000 classified by age of mother and the results of the 1993 National Survey on Reproductive Health and Family Formation.
Infant and child mortality: Based on births and infant deaths registered through 2000.
Life expectancy at birth: Based on a life table for 1999-2001 derived from: (a) registered deaths by age and sex for 2000 and the 2000 census population by age and sex and (b) adjusted estimates of infant and child mortality derived from vital registration.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during each intercensal period. In addition, the following information was taken into account: (a) tabulations of births by nationality of mother for 1980-1990; (b) data on arrivals and departures of Costa Rican nationals and registration of foreigners for 1987-1996; (c) the number and characteristics of the foreign-born population enumerated in the 1973, 1984 and 2000 census counts; and (d) the number and characteristics of Costa Ricans enumerated by the censuses of major receiving

countries in the Americas from the 2000 round of census counts.

CÔTE D'IVOIRE

Total population (2005): Estimated to be consistent with the 1988 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) data from the 1988 census on births in the preceding 12 months classified by age of mother and (b) data on children ever born and births in the preceding 12 months, both classified by age of mother and maternity-history data from the 1994 and 1998-1999 DHS. Official estimates for 2000-2004 were also considered.
Infant and child mortality: Infant mortality estimates are derived from the child mortality rates using the South model of the Coale-Demeny Model Life Tables. Child mortality estimates are based on: (a) data on children ever-born and surviving classified by age of mother; (b) maternity-history data from the 1994 and 1998-1999 DHS; and (c) estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the South model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on: (a) refugee statistics compiled by UNHCR; (b) the stock of foreigners enumerated by the censuses of Côte d'Ivoire; (c) the number of migrants originating in Côte d'Ivoire according to the statistics of developed countries; and (d) the results of the migration surveys conducted by CERPOD (Enquête REMUAO).

CROATIA

Total population (2005): Estimated to be consistent with the 2001 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2004 classified by age of mother.
Infant and child mortality: Based on births and infant deaths registered through 2004.
Life expectancy at birth: Based on deaths registered through 2004 by age and sex and the underlying population by age and sex. The age pattern of mortality is based on a life table derived from average deaths in 2000-2002 and the 2001 population by age and sex.
International migration: Based on: (a) the estimated number of refugees entering Croatia from Bosnia-Herzegovina and Yugoslavia and the number of persons leaving Croatia and entering other European countries and countries of immigration overseas and (b) estimates of net international migration derived as the difference between overall population growth and natural increase.

CUBA

Total population (2005): Estimated to be consistent with census enumerations and with the 2005 population register and estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2005 classified by age of mother.
Infant and child mortality: Based on births and infant deaths registered through 2005.
Life expectancy at birth: Based on deaths registered through 2005 classified by age and sex and on the underlying population by age and sex.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during each intercensal period. In addition, the number and characteristics of Cuban enumerated by the censuses of major receiving countries in the Americas and the number of Cuban immigrants received by the United States of America were taken into account.

CYPRUS

Total population (2005): Estimated to be consistent with the 2001 census, with official population estimates for 2003 and with estimates

of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2003 classified by age of mother.
Infant and child mortality: Based on births and infant deaths registered through 2002.
Life expectancy at birth: Based on an official life table for 2003.
International migration: Based on reported number of permanent arrivals and departures by age and sex through 2002.

CZECH REPUBLIC

Total population (2005): Estimated to be consistent with the 2001 census, with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2005.
Life expectancy at birth: Based on official estimates of life expectancy available through 2005. The age pattern of mortality is based on an official life table for 2000-2005.
International migration: Based on official estimates of net international migration available through 2005.

DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA

Total population (2005): Estimated to be consistent with the 1993 census, with official population estimates for 2004 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on estimates of total fertility so that they are consistent with the age distribution of the population as enumerated by the 1993 census.
Infant and child mortality: Based on official death reports and estimates of UNICEF.
Life expectancy at birth: Based on official estimates of life expectancy.
International migration: Net international migration was estimated based on secondary sources.

DEMOCRATIC REPUBLIC OF THE CONGO

Total population (2005): Estimated to be consistent with the 1984 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on data on maternity-history data from the 2005 DHS.
Infant and child mortality: Based on data on children ever born and surviving from the Demographic Survey of Western Zaire conducted in 1974-1977, the Multiple Indicator Cluster Surveys conducted in 1995 and 2000 and the 2005 DHS. A 1984 census estimate was also considered. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. The unusual numbers of deaths due to war in the late 1990s were also taken into account. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR.

DENMARK

Total population (2005): Estimated to be consistent with official population estimates for 2005. *Total fertility:* Based on official estimates of total fertility available through 2005.
Infant and child mortality: Based on births and infant deaths registered through 2004.
Life expectancy at birth: Based on an official life table for 2004-2005. The age pattern of mortality is based on an official life table for 1995-2000.
International migration: Based on official estimates of international migration and estimates derived as the difference between overall population growth and natural increase through 2005.

DJIBOUTI

Total population (2005): Estimated to be consistent with the 1983 census and the 1991 Intercensal Demographic Survey, both adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 2002 Djibouti EDSF/PAPFAM survey. Retrospective estimates were taken into account while the more recent estimate was disregarded since it differed greatly from the official DISEP estimate.
Infant and child mortality: Based on maternity-history data from the 2002 Djibouti EDSF/PAPFAM survey and estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR and on reports of additional migration flows of persons not qualifying as refugees. Projected migration is based on the assumption that refugees in Djibouti will return to their countries of origin by 2020 and that most persons who migrated to Djibouti as a result of conflict in their countries will also return to them by 2020.

DOMINICA

Total population (2005): Estimated to be consistent with the 1991 and 2001 censuses and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on estimates of total fertility through 2006.
Infant and child mortality: Based on estimates from UNICEF.
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the Far Eastern model of the Coale-Demeny Model Life Tables.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase.

DOMINICAN REPUBLIC

Total population (2005): Estimated to be consistent with the 2002 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1996 and 2002 Encuesta Demográfica y de Salud (ENDESA/DHS).
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 1986, 1991, 1996 and 2002 Dominican Republic DHS (ENDESA). The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on estimates of adult mortality derived from maternal orphanhood reports in the 1996 Dominican Republic DHS (ENDESA) and on estimates of mortality in childhood from the 2002 ENDESA. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on information on immigrants to the United States of America, the stock of Dominican migrants in the United States (from censuses (1990 and 2000) and the Current Population Survey) and information on international migration provided by the 1991 Dominican Republic DHS.

ECUADOR

Total population (2005): Estimated to be consistent with the 2001 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) births registered through 2000 and (b) maternity-history data and data on children ever born classified by age of mother from the 1994 and 1999 Encuesta

Demográfica y de Salud Materna e Infantil (ENDEMAIN) and the 2001 census.
Infant and child mortality: Based on: (a) births and infant deaths registered through 2002; (b) data on children ever born and surviving classified by age of mother from the 1990 and 2001 censuses; and (c) estimates from the 1994, 1999 and 2004 Encuesta Demográfica y de Salud Materna e Infantil (ENDEMAIN).
Life expectancy at birth: Based on a life table for 2000-2002 derived from: (a) registered deaths by age and sex for 2000-2002 adjusted for underregistration by growth-balance techniques and the 2001 census population by age and sex and (b) estimates of infant and child mortality.
International migration: Net international migration for the period 1990-2000 was estimated on the basis of information on Ecuadorians abroad, mainly those enumerated in Spain and the United States of America.

EGYPT

Total population (2005): Estimated to be consistent with the 1996 census and with estimates of the subsequent trends in fertility, mortality and international migration. As compare to the results of the 2006 census, which were made available after the completion of the 2006 Revision, existing estimates assume an undercount of 2.7 per cent.
Total fertility: Based on maternity-history data from the 1988, 1992, 1995, 2000 and 2005 Egypt DHS.
Infant and child mortality: Based on: (a) data on children ever born and surviving classified by age of mother from the 1992, 1995, 2000, 2003 and 2005 Egypt DHS and (b) estimates from UNICEF.
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the East model of the Coale-Demeny Model Life Tables. Official estimates for the years 2002 and 2003 were also considered.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1986-1996 intercensal period.

EL SALVADOR

Total population (2005): Estimated to be consistent with the 1992 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) data on children ever born classified by age of mother and data on births in the preceding 12 months classified by age of mother, from the 1992 census and (b) births classified by age of mother and registered through 1993. Estimates for later periods were compared with those yielded by the Encuesta Nacional de Salud Familiar (FESAL-98 and FESAL 2002-2003) and were found to be consistent with the latter.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from FESAL-93. Results from FESAL-98 and FESAL-2002-03 were also taken into account.
Life expectancy at birth: Based on a life table for 1991-1993 derived from: (a) registered deaths by age and sex for 1991-1993 adjusted for underregistration with the growth balance technique and the 1992 census population by age and sex and (b) estimates of infant and child mortality.
International migration: Based on estimates of international migration produced by research institutions in El Salvador and on refugee data from UNHCR.

EQUATORIAL GUINEA

Total population (2005): Estimated to be consistent with the 1983 census adjusted for underenumeration and the 2002 census preliminary total, as well as with intercensal estimates of the trends in fertility, mortality and international migration. Results of the 1994 census were also considered.
Total fertility: Based on data on children ever born classified by age of mother and date of birth of last child from the 1983 census. Preliminary results from the 2002 census considered.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 1983, 1994 and 2001

censuses and 2000 MICS. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR.

ERITREA

Total population (2005): Estimated to be consistent with the results relative to Eritrea from the 1984 Population and Housing Census of Ethiopia and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1995 Eritrea DHS and on estimates from the 2002 Eritrea DHS adjusted by applying the P/F ratio method.
Infant and child mortality: Based on: (a) data on children ever born and surviving classified by age of mother from the 1995 and 2002 Eritrea DHS and (b) estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the Far Eastern model of the United Nations Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR and on assumed levels of emigration.

ESTONIA

Total population (2005): Estimated to be consistent with official population estimates for 2004 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2004, adjusted upward through 1980 by a factor of 1.25 to compensate for infant deaths omitted owing to the use of a definition of infant death that did not conform to international standards.
Life expectancy at birth: Based on official estimates of life expectancy available through 2004. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on official estimates of international migration and estimates derived as the difference between overall population growth and natural increase through 2004.

ETHIOPIA

Total population (2005): Estimated to be consistent with the 1994 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration. Official estimates for the years 2002 and 2006 were also considered.
Total fertility: Based on: (a) maternity-history data from the 2000 and 2005 Ethiopia DHS and (b) data on births during the past 12 months, classified by age of mother, from the 1994 census; estimates were adjusted upward for underreporting of births.
Infant and child mortality: Based on: (a) maternity-history data from the 2000 and 2005 Ethiopia DHS; (b) data on children ever born and surviving, classified by age of mother, from the 1990 Family and Fertility Survey; and (c) estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR and on assumed levels of emigration.

FAEROE ISLANDS

Total population (2005): Estimated to be consistent with the 1977 census, with official population estimates produced by UNSD for 2003 and with estimates of the subsequent trends in fertility, mortality and international migration.

FALKLAND ISLANDS (MALVINAS)

Total population (2005): Estimated to be consistent with the 1996 and 2001 censuses and with estimates of the subsequent trends in fertility, mortality and international migration.

FIJI

Total population (2005): Estimated to be consistent with the 1996 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on the analysis of the 1986 and 1996 census results and on the application of the own-children method and the P/F ratio method to the results of the 1986 and 1996 censuses.
Infant and child mortality: Based on: (a) data on children ever born and children surviving by age of mother from the 1996 census and (b) the number of registered births by sex and infant deaths by age and sex for 1995-1997.
Life expectancy at birth: Based on a life table derived from registered deaths by age and sex for 1995-1997 and the underlying population by age and sex, smoothed by assuming that the age pattern of mortality conforms to the Far Eastern model of the United Nations Model Life Tables.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1986-1996 intercensal period.

FINLAND[7]

Total population (2005): Estimated to be consistent with official population estimates for 2005.
Total fertility: Based on official estimates of total fertility available through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2004.
Life expectancy at birth: Based on official estimates of life expectancy derived from registered deaths and available through 2004. The age pattern of mortality was obtained from an official 2002 life table.
International migration: Based on official estimates of international migration and estimates derived as the difference between overall population growth and natural increase through 2005.

FRANCE

Total population (2005): Estimated to be consistent with the 1999 census and with estimates of the subsequent trends in fertility, mortality and international migration. Population estimates exclude the overseas departments, namely, French Guyana, Guadeloupe, Martinique and Réunion.
Total fertility: Based on official estimates of total fertility through 2005.
Infant and child mortality: Based on births and infant deaths registered through 2005.
Life expectancy at birth: Based on an official life table for 2005 derived from registered deaths and the results of the 1999 census.
International migration: Based on official estimates of net international migration available through 2005.

FRENCH GUIANA

Total population (2005): Estimated to be consistent with the 1999 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2003 and total number of births.
Infant and child mortality: Based on infant deaths registered through 2003.
Life expectancy at birth: Derived from official estimates of life expectancy for 2003 and estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables.

International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1990-1999 intercensal period. Official migration statistics for the period 1990-1999 and the 2004 Greater Caribbean Survey were also considered as well as the number of immigrants admitted to the United States.

FRENCH POLYNESIA

Total population (2005): Estimated to be consistent with the 2002 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2002 classified by age of mother.
Infant and child mortality: Based on births and infant deaths registered through 2003.
Life expectancy at birth: Based on official estimates of life expectancy derived from registered deaths through 1996.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase through 2002.

GABON

Total population (2005): Estimated to be consistent with the 1993 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 2000 Gabon DHS.
Infant and child mortality: Based on data on children ever born and surviving from the 2000 Gabon DHS. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1970-1993 intercensal period and on information on the stock of refugees derived from the historical database maintained by UNHCR.

GAMBIA

Total population (2005): Estimated to be consistent with the 2003 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on estimates from the 1990 Contraceptive Prevalence Survey and data on births in the past year from the 1983, 1993 and 2003 censuses and the 2001 National Survey on Mortality and Contraceptive Prevalence. Children ever born data from the 1993/94 Household Education and Health Survey and 2000 Gambia Multiple Indicator Cluster Survey (MICS-2) were also considered.
Infant and child mortality: Infant mortality estimates are derived from the child mortality rates using INDEPTH Pattern 1 relational model (INDEPTH Network, 2004. INDEPTH Model Life Tables for Sub-Saharan Africa. Table 4.2, p. 24). Child mortality estimates are based on: (a) the South model of the Coale-Demeny Model Life Tables and data on children ever born and surviving classified by age of mother from the 1973, 1983 and 1993 censuses and the 2000 Gambia MICS; and (b) recent deaths from the same sources and the 1990 Gambia Contraceptive Prevalence and Fertility Determinants Survey and the 1993/94

Household Education and Health Survey. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Estimated with INDEPTH Pattern 1 relational model (INDEPTH Network, 2004. INDEPTH Model Life Tables for Sub-Saharan Africa. Table 4.2, p. 24) using two parameters: (1) direct and indirect estimates of child mortality and (2) adjusted estimates of adult mortality (45q15) derived from (a) recent household deaths data from the 1973 census and (b) parental orphanhood from the 1973 and 1983 censuses. Data for demographic surveillance sites (Farafenni, Keneba, Upper River Division) were also considered. The demographic impact of

AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1983-1993 intercensal period.

GEORGIA

Total population (2005): Estimated to be consistent with the 2002 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2002 and on 2005 Georgia RHS.
Infant and child mortality: Based on maternity-history data from the 1999 Reproductive Health Survey.
Life expectancy at birth: Based on official estimates of life expectancy available through 2002, adjusted for underregistration. The age pattern of mortality is based on a life table derived from deaths in 2001, adjusted for underregistration and the underlying population by age and sex.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1989-2002 intercensal period.

GERMANY

Total population (2005): Estimated to be consistent with official population estimates for 2004 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2002.
Life expectancy at birth: Based on official estimates of life expectancy available through 2003.
International migration: Based on estimates of net international migration derived from flow statistics available through 2005 and official population projections.

GHANA

Total population (2005): Estimated to be consistent with the 2000 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on data on children ever born and births in the preceding 12 months, both classified by age of mother and maternity-history data from the 1979-1980 Ghana WFS and the 1988, 1993, 1998 and 2003 Ghana DHS.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 1968-1969 National Demographic Survey, the 1979-1980 Ghana WFS and the 1988, 1993, 1998 and 2003 Ghana DHS. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR and on the number of Ghanaians migrating to selected developed countries.

GIBRALTAR

Total population (2005): Estimated to be consistent with the 2001 census, with official population estimates for 2004 and with estimates of the subsequent trends in fertility, mortality and international migration.

GREECE

Total population (2005): Estimated to be consistent with the 2001 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2001.
Infant and child mortality: Based on births and infant deaths registered through 2002.
Life expectancy at birth: Based on official estimates of life expectancy available through

2004. The age pattern of mortality is based on an official life table for 1990-1995.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase between 1990 and 2004.

GREENLAND

Total population (2005): Estimated to be consistent with the 1976 census, with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2003.
Infant and child mortality: Based on official estimates of infant and child mortality available through 2003.
Life expectancy at birth: Based on official estimates of life expectancy available through 2003. The age pattern of mortality is based on an official life table for 1991-1995.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase through 2004.

GRENADA

Total population (2005): Estimated to be consistent with the 1981, 1991 and 2001 censuses and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2000 classified by age of mother.
Infant and child mortality: Based on estimates from UNICEF.
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase.

GUADELOUPE

Total population (2005): Estimated to be consistent with the 1999 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2003 and official estimates of registered births.
Infant and child mortality: Based on births and infant deaths registered through 2003.
Life expectancy at birth: Based on a life table for 1990 derived from registered deaths by age and sex and the 1990 mid-year population by age and sex and on the trends implied by estimates of life expectancy available for 1996 and 1997. Official estimates of life expectancy for 2003 were also considered.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1982-1990 and 1990-1999 intercensal periods.

GUAM

Total population (2005): Estimated to be consistent with the 2000 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2004 classified by age of mother, adjusted downward to account for births to non-resident women in Guam hospitals and to be consistent with children under age five enumerated in the 2000 census.
Infant and child mortality: Based on births and infant deaths registered through 2004.
Life expectancy at birth: Based on a life table for 1990 derived from: (a) average number of registered deaths by age and sex of the years 1988-1992 and (b) the 1990 census population by age and sex and on the trends implied by the number of deaths registered through 2004.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1990-2000 intercensal period. Data on the reduction in the

number of military personnel and their dependants were also taken into account.

GUATEMALA

Total population (2005): Estimated to be consistent with the 2002 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) data on children ever born and births during the 12 months preceding interview, classified by age of mother, from the 1987, the 1995, 1998/99 and 2002 Encuestas Nacionales de Salud Materno Infantil (ENSMI), the 1987 and 1989 Encuestas Nacionales Socio-demográficas (ENSD) and the 1994 census and (b) vital registration and estimates from the 2002 census.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 1995 and 2002 Encuestas Nacionales de Salud Materno Infantil (ENSMI), the 1987 and 1989 Encuestas Nacionales Socio-demográficas (ENSD) and the 1994 and 2002 census. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on life tables for the period 1950-2001 derived from registered deaths. The most recent life table is calculated from registered deaths by age and sex for 1999-2001, also considering the 2002 census and estimates of infant and child mortality through 2001. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on estimates derived from the number and characteristics of Guatemalans enumerated in the 1990 and 2000 census rounds of Costa Rica, Honduras, Mexico and the United States of America and data from the International Organization for Migration (IOM) survey.

GUINEA

Total population (2005): Estimated to be consistent with the 1996 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on data on children ever born and births in the preceding 12 months, both classified by age of mother and maternity-history data from the 1992, 1999 and 2005 Guinea DHS. Estimates from the 1983 and 1996 censuses were also considered.
Infant and child mortality: Based on maternity-history data and on data on children ever born and surviving classified by age of mother from the 1992, 1999 and 2005 Guinea DHS. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the South model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR.

GUINEA-BISSAU

Total population (2005): Estimated to be consistent with the 1979 census adjusted for underenumeration, with the total population enumerated by the 1991 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: In the absence of statistics indicative of fertility levels and trends, total fertility was assumed to have levels and follow trends similar to those estimated for neighbouring countries with similar socio-economic conditions as those of Guinea-Bissau. An estimate of total fertility derived from data on children ever born from the 2000 Guinea-Bissau MICS was also taken into account.
Infant and child mortality: Estimates are derived from the level of life expectancy by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. An indirect estimate of infant mortality derived from data on children ever born and surviving from the 2000 Guinea-Bissau MICS was also taken into account. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: In the absence of statistics indicative of mortality levels and

trends, life expectancy was assumed to have levels and follow trends similar to those estimated for neighbouring countries with similar socio-economic conditions as those of Guinea-Bissau. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR.

GUYANA

Total population (2005): Estimated to be consistent with the 1991 and 2002 censuses and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) data on children ever born classified by age of mother and births in the 12 months preceding enumeration classified by age of mother from the 1980 and 1991 censuses; (b) results from the 1986 Guyana Demographic Survey; and (c) the number of births registered during 1990.
Infant and child mortality: Based on: (a) data on children ever born and surviving classified by age of mother, information on the survival of the last-born child of female respondents and on deaths within the household during the five years preceding the survey from the 1986 Guyana Demographic Survey; (b) tabulations on the survival of the last-born child from the 1991 census; and (c) child mortality estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on: (a) a life table for 1986 derived from the number of deaths by age and sex for the period 1981-1986 recorded by the 1986 Guyana Demographic Survey and (b) estimates of infant and child mortality. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on: (a) estimates of net international migration derived as the difference between overall population growth and natural increase during the 1980-1991 intercensal period; (b) registered number of arrivals and departures (excluding visitors) through 1999; and (c) number of immigrants admitted to the United States of America through 2004.

HAITI

Total population (2005): Estimated to be consistent with the 2003 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from: (a) the 1977 Enquête Haitienne sur la Fécondité (EHF); (b) the 1983 Enquête Haitienne sur la Prévalence de la Contraception (EHPC); (c) the 1987, 1994-1995 and 2005-2006 Enquêtes de Mortalité, Morbidité et Utilisation des Services (EMMUS) and (d) the 2003 census.
Infant and child mortality: Based on maternity-history data from the 2000 DHS (EMMUS-III) and the 2005-2006 DHS (EMMUS-IV). The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on a life table for 1970-1971 derived from: (a) registered deaths by age and sex adjusted for incompleteness using the growth-balance method and the 1971 census population by age and sex and (b) estimated trends in infant mortality. Another life table was created based on the 2003 census and data from the EMMUS IV 2005-2006. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on the number and characteristics of Haitians enumerated in the 1990 and 2000 round of censuses of Canada, the Dominican Republic and the United States of America.

HOLY SEE

Total population (2005): Estimated to be consistent with official population data provided by the Vatican City State for 1954-1998 and with estimates of the subsequent trends in mortality and international migration.

HONDURAS

Total population (2005): Estimated to be consistent with the 2001 census adjusted for

underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1996 Encuesta Nacional de Epidemiología y Salud Familiar (ENESF).
Infant and child mortality: Based on maternity-history data from the 1996 ENESF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on a life table for 1988 derived from: (a) registered deaths by age and sex for 1988 adjusted for underregistration using the growth-balance method and the population by age and sex from the 1988 census and (b) estimates of infant and child mortality. Direct estimates from the 1996 Encuesta Nacional de Epidemiología y Salud Familiar (ENESF) were also considered. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on official estimates of international migration and estimates of people from Honduras living as foreign-born in other countries through 2000.

HUNGARY

Total population (2005): Estimated to be consistent with the 2001 census, with official population estimates for 2006 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility through 2005.
Infant and child mortality: Based on births and infant deaths registered through 2005.
Life expectancy at birth: Based on official estimates of life expectancy available through 2005. The age pattern of mortality is based on an official life table for 2002.
International migration: Based on official estimates of international migration available through 2003.

ICELAND

Total population (2005): Estimated to be consistent with official population estimates for 2005.
Total fertility: Based on births registered through 2005 classified by age of mother.
Infant and child mortality: Based on births and infant deaths registered through 2005.
Life expectancy at birth: Based on an official life table for 2001-2005. The age pattern of mortality is based on an official life table for 1996-2000.
International migration: Based on official estimates of international migration and estimates derived as the difference between overall population growth and natural increase through 2005.

INDIA

Total population (2005): Estimated to be consistent with the 1991 and 2001 censuses, adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) adjusted data from the Sample Registration System for age-specific fertility rates through 2002 and (b) maternity-history data from the 1992-1993 and 1998-1999 India National Family Health Surveys (NFHS-1 and 2/DHS).
Infant and child mortality: Based on data from the Sample Registration System through 2004 and the 1992-1993 and 1998-1999 India National Family Health Surveys (NFHS-1 and 2/DHS). The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on life tables derived from age and sex-specific mortality rates from the Sample Registration System up to 1999-2003 adjusted for infant and child mortality. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on emigration data from India to developed countries and on labour migration data from India to other Asian countries.

INDONESIA

Total population (2005): Estimated to be consistent with the 2000 census adjusted for underenumeration and with estimates of the

subsequent trends in fertility, mortality and international migration.

Total fertility: Based on maternity-history data from the 1991, 1994, 1997 and 2002 Indonesia DHS, own children estimates from the 1971, 1980 and 1990 censuses and estimates from the 1976 Indonesia Fertility Survey and the 1987 National Indonesia Contraceptive Prevalence Survey.

Infant and child mortality: Based on: (a) maternity-history data from the 1991, 1994, 1997 and 2002 DHS and indirect estimates from the 1971, 1980 and 1990 censuses, the 1976 Indonesia Fertility Survey and the 1987 National Indonesia Contraceptive Prevalence Survey and (b) estimates from UNICEF.

Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables.

International migration: Based on information regarding Indonesians admitted by the main countries of immigration, data on labour migration and on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1980-1990 intercensal period.

IRAN (ISLAMIC REPUBLIC OF)

Total population (2005): Estimated to be consistent with the 1996 census, with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.

Total fertility: Based on fertility estimates from the 1996 census and the 2000 Iran Demographic Health Survey.

Infant and child mortality: Based on: (a) data from the 1973 and 1998 Population Growth Surveys, the 1986 and 1996 censuses, the 2000 Iran Demographic Health Survey and (b) estimates from UNICEF.

Life expectancy at birth: Based on official life expectancy estimates reported for the year 2001. The age pattern of mortality is based on the East model of the Coale-Demeny Model Life Tables.

International migration: Based on refugee statistics compiled by UNHCR and on data on migrants from Iran to developed countries.

IRAQ

Total population (2005): Estimated to be consistent with the 1997 census and with estimates of the subsequent trends in fertility, mortality and international migration. The population estimates refer to the whole of Iraq, including the three northern governorates. Official total population estimates for the years 2003 and 2004 were also taken into account.

Total fertility: Based on data on children ever born classified by age of mother from the 1987 census and on the age pattern of fertility derived from that census and from birth registration data. Estimates from ESCWA were taken into account for the 1995-2000 period.

Infant and child mortality: Based on estimates from UNICEF and on data from the 1999 Child and Maternal Mortality Survey and the 1997 census. Considering the results of recent surveys, that were made available after the end of this Revision, it should be noted that there is great uncertainty about the child mortality levels in Iraq.

Life expectancy at birth: Derived from registered deaths for 1985-1987 classified by age and sex and the 1987 census population, adjusting the former for underregistration. For 1990-1995, the estimates of life expectancy were revised in light of a study conducted in 1992 so as to take into account the consequences of the Gulf war. For 1995-2000, levels by sex are based on 1998 estimates from ESCWA; the age pattern of mortality is based on the East model of the Coale-Demeny Model Life Tables. For 2000-2005 and 2005-2010, excess mortality due to the war was factored in the overall mortality levels; there is a high level of uncertainty in the current estimates. The estimated numbers of war related deaths, as provided by the Iraqi Ministry of Health, have also been taken into account.

International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1997-2004 period. Data on refugee flows compiled by UNHCR were also taken into account. Estimates of Iraqis entering and leaving the country because of the war have been taken into account.

IRELAND[8]

Total population (2005): Estimated to be consistent with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2003.
Life expectancy at birth: Based on official estimates of life expectancy derived from registered deaths and available through 2003. The age pattern of mortality was derived from an official life table for 2001-2003.
International migration: Based on official estimates of international migration and estimates derived as the difference between overall population growth and natural increase through 2005.

ISLE OF MAN

Total population (2005): Estimated to be consistent with the 2001 census, with official population estimates for 2004 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: In the absence of statistics indicative of fertility levels and trends, total fertility was assumed to have levels and follow trends similar to those estimated for neighbouring countries with similar socio-economic conditions as those of Isle of Man.
Infant and child mortality: In the absence of statistics indicative of mortality in childhood, infant mortality was assumed to have levels and follow trends similar to those estimated for neighbouring countries with similar socio-economic conditions as those of Isle of Man.
Life expectancy at birth: In the absence of statistics indicative of mortality levels and trends, life expectancy was assumed to have levels and follow trends similar to those estimated for neighbouring countries with similar socio-economic conditions as those of Isle of Man.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase.

ISRAEL

Total population (2005): Estimated to be consistent with the 1995 census and with estimates of the subsequent trends in fertility, mortality and international migration. Population figures exclude the Arab population residing in East Jerusalem and include the Israeli citizens residing in the Occupied Palestinian Territory. Official population estimates for the years 2000, 2004 and 2005 from the Israeli Central Bureau of Statistics were also considered.
Total fertility: Based on births registered through 2004 classified by age of mother.
Infant and child mortality: Based on births and infant deaths registered through 2003.
Life expectancy at birth: Based on official estimates of life expectancy available through 2003 and a life table derived from age specific mortality rates for the 2000-2002 period.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1995-2005 period. Assumptions on migration levels made in the official Israeli population projections were also considered.

ITALY

Total population (2005): Estimated to be consistent with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2005.
Infant and child mortality: Based on births and infant deaths registered through 2001.
Life expectancy at birth: Based on official estimates of life expectancy available through 2003. The age pattern of mortality is based on an official life table for 1998.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase through 2005.

JAMAICA

Total population (2005): Estimated to be consistent with the 2001 census and with

estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2000 classified by age of mother and TFR estimates from the Planning Institute of Jamaica for 2000-2005.
Infant and child mortality: Based on estimates from WHO, UNICEF and the Planning Institute of Jamaica. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on an official life table for 2000 prepared by WHO. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1991-2001 intercensal period. Also, net migration estimates from the Planning Institute of Jamaica for the period 2000-2005 were considered.

JAPAN

Total population (2005): Estimated to be consistent with the 2000 census, with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2004 classified by age of mother.
Infant and child mortality: Based on births and infant deaths registered through 2003.
Life expectancy at birth: Based on an official life table for 2000 and official estimates of life expectancy through 2005.
International migration: Based on estimates of net international migration derived from official information on emigration of Japanese to the main receiving countries and from information on the change in the numbers of registered foreigners through 2001.

JORDAN

Total population (2005): Estimated to be consistent with the 1994 census, the adjusted total population from the 2004 census and with estimates of the subsequent trends in fertility, mortality and international migration. Revised total population estimates through 2005 from the Jordanian Department of Statistics were also taken into account, with some adjustments in order to incorporate the influx of Iraqis.
Total fertility: Based on maternity-history data from the 1990, 1997 and 2002 Jordan Population and Family Health Surveys (DHS).
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 1994 Post-Enumeration Survey conducted after the 1994 census, the 1995 Jordanian Society Survey, the 1998 and 1999 Jordan Annual Fertility Surveys, the 1997 and 2002 Jordan Population and Family Health Surveys and estimates from UNICEF.
Life expectancy at birth: Based on official estimates from ESCWA and WHO.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1994-2004 intercensal period. Official population estimates for the years 2000 and 2005 were also considered. Estimates of Iraqis entering Jordan because of the war in Iraq have been taken into account.

KAZAKHSTAN

Total population (2005): Estimated to be consistent with the 1999 census, with an official estimate for 1 July 2005 and with estimates of trends in fertility, mortality and international migration.
Total fertility: Based on the 1999 Kazakhstan DHS and official estimates of total fertility available through 2004.
Infant and/or child mortality: Based on data on children ever born and surviving classified by age of mother from the 2006 Kazakhstan MICS.
Life expectancy at birth: Based on a life table derived from registered deaths by age and sex for 2003, adjusting infant and child mortality rates to be consistent with rates from the 2006 Kazakhstan MICS.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase through 2005.

KENYA

Total population (2005): Estimated to be consistent with the 1999 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1989, 1993, 1998 and 2003 Kenya DHS.
Infant and child mortality: Based on data on children ever born and surviving from the 1989, 1993, 1998 and 2003 Kenya DHS. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR and on the number of migrants from Kenya to developed countries and assuming that refugees in Kenya will return during 2005-2015.

KIRIBATI

Total population (2005): Estimated to be consistent with the 2005 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on an application of the P/F ratio method to data on children ever born and births during the year preceding the 2000 census.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 2000 census.
Life expectancy at birth: Based on: (a) the estimated level of infant and child mortality; (b) tabulations of parental survivorship (orphanhood) by age of respondent from the 2000 census; and (c) by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the intercensal periods.

KUWAIT

Total population (2005): Estimated to be consistent with the 1995 census, the 2000 mid-year population estimate from the Public Authority of Civil Information of Kuwait and with estimates of the subsequent trends in fertility, mortality and international migration. Official population estimates for 1996, 1998 and 2004 were also taken into account, as well a preliminary total population estimate for 2005, as reported by the Ministry of Planning of Kuwait.
Total fertility: Based on births registered through 2002 classified by age of mother.
Infant and child mortality: Based on births and infant deaths registered through 2004 and under-five mortality estimates from WHO and UNICEF.
Life expectancy at birth: Based on a life table for 1998 derived from registered deaths by age and sex for 1998 and the underlying population by age and sex. The levels of life expectancy for the 1995-2000 period were adjusted while taking into account estimates from ESCWA and WHO.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1995-2000 period.

KYRGYZSTAN

Total population (2005): Estimated to be consistent with the 1999 census, with official population estimates for 2004 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility through 2004. Estimates from the 1997 Kyrgyzstan DHS were also considered.
Infant and child mortality: Based on maternity-history data from the 1997 Kyrgyzstan DHS and on estimates of infant and child mortality from UNICEF.
Life expectancy at birth: Based on official estimates of life expectancy available through

2004, adjusted to take into account underreporting of infant and child mortality.
International migration: Based on official estimates of net international migration available through 1995 and on estimates derived as the difference between overall population growth and natural increase through 2004.

LAO PEOPLE'S DEMOCRATIC REPUBLIC

Total population (2005): Estimated to be consistent with the 2005 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 1993 Laos Social Indicator Survey and the 1995 and 2005 censuses and (b) maternity-history data from the 1994 Fertility and Birth Spacing Survey and the 2000 Lao Reproductive Health Survey.
Infant and child mortality: Based on: (a) maternity-history data from the 1994 Fertility and Birth Spacing Survey and the 2000 Lao Reproductive Health Survey and (b) data on children ever born and surviving classified by age of mother from the 1993 Laos Social Indicator Survey, the 1995 and 2005 censuses and 2000 Lao Reproductive Health Survey.
Life expectancy at birth: Derived from estimates of infant and child mortality assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables.
International migration: Based on estimates of international migration for the 1995-2005 intercensal period and UNHCR estimates.

LATVIA

Total population (2005): Estimated to be consistent with official population estimates for 2005.
Total fertility: Based on official estimates of total fertility through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2002.
Life expectancy at birth: Based on official estimates of life expectancy derived from registered deaths and available through 2004. The age pattern of mortality is derived from an official life table for 1998.
International migration: Based on official estimates of international migration and estimates derived as the difference between overall population growth and natural increase through 2005.

LEBANON

Total population (2005): Estimated to be consistent with the 2004 population provided by the Central Administration for Statistics of Lebanon (CAS), adjusted to take into account the number of Palestinians residing in camps and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) age-specific fertility rates from the 1970 Lebanon Labour Force Survey; (b) data from the 1996 Lebanon Maternal and Child Health Survey; (c) data from the 1996 Lebanon Population and Housing Survey; and (d) estimates from ESCWA.
Infant and child mortality: Based on data from the 1996 Lebanon Maternal and Child Health Survey and from the 2001 Lebanon Multiple Indicator Cluster Survey (MICS).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1970-2004 period. For subsequent periods, data on refugee flows compiled by UNHCR were taken into account.

LESOTHO

Total population (2005): Estimated to be consistent with the 1996 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) maternity-history data from the 2004 Lesotho DHS; (b) estimates derived from the 2002 Lesotho Reproductive

Health Survey and the 1991 Lesotho Demographic and Health Survey; and (c) data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 1986 census.
Infant and child mortality: Based on: (a) maternity-history data from the 2004 Lesotho DHS; (b) data from the 2001 Lesotho Multiple Indicator Cluster Survey (MICS); (c) estimates from the 2001 Lesotho Demographic Survey; (d) data on children ever born and surviving, classified by age of mother, from the 1986 and 1996 censuses and (e) estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR and on data on the number of migrant workers in South Africa.

LIBERIA

Total population (2005): Estimated to be consistent with the 1984 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1986 Liberia DHS.
Infant and child mortality: Based on maternity-history data from the 1986 Liberia DHS. Mortality levels were adjusted during the 1990s to take into account the consequences of the civil war. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables. Mortality levels were adjusted during the 1990s to take into account the consequences of the civil war. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR.

LIBYAN ARAB JAMAHIRIYA

Total population (2005): Estimated to be consistent with the total population of the 1995 census, adjusted upwardly to take into account the expatriates and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1995 PAPCHILD Survey of the Libyan Arab Jamahiriya.
Infant and child mortality: Based on maternity-history data from the 1995 PAPCHILD Survey of the Libyan Arab Jamahiriya and estimates from UNICEF.
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the Far Eastern model of the United Nations Model Life Tables. Estimates from WHO for the year 2002 were also taken into account.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1984-1995 intercensal period.

LIECHTENSTEIN

Total population (2005): Estimated to be consistent with the 1990 census, with official population estimates for 2004 and with estimates of the subsequent trends in fertility, mortality and international migration.

LITHUANIA

Total population (2005): Estimated to be consistent with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2002, adjusted upward by a factor of 1.25 prior to 1991, to

compensate for infant deaths omitted owing to the use of a definition of infant death that does not conform to international standards.
Life expectancy at birth: Based on official estimates of life expectancy derived from registered deaths and available through 2004. The age pattern of mortality is derived from an official life table for 1998.
International migration: Based on official estimates of international migration and estimates derived as the difference between overall population growth and natural increase through 2004.

LUXEMBOURG

Total population (2005): Estimated to be consistent with the 2001 census, the 2005 official population estimates and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility through 2005.
Infant and child mortality: Based on births and infant deaths registered through 2003.
Life expectancy at birth: Based on official estimates of life expectancy derived from registered deaths through 2003.
International migration: Based on official estimates of international migration available through 2005.

MADAGASCAR

Total population (2005): Estimated to be consistent with the 1993 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) maternity-history data from the 1992, 1997 and 2003-04 Madagascar DHS and (b) data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 1993 census. Census estimates were adjusted upwards by applying the P/F ratio method.
Infant and child mortality: Based on maternity-history data from the 1992 and 1997 Madagascar DHS and estimates from UNICEF. For the period 2000-2005, estimates from UNICEF and the 2003-04 DHS were also considered. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on data on persons born in Madagascar and enumerated by the censuses of key countries of destination, especially France.

MALAWI

Total population (2005): Estimated to be consistent with the 1998 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1992, 2000 and 2004 Malawi DHS and on estimates derived from the 1977 and 1987 censuses and the 1984 Family Formation Survey.
Infant and child mortality: Child mortality based on maternity-history data from the 1992, 2000 and 2004 Malawi DHS; estimates from UNICEF were also considered. Infant mortality estimates for the period 1995-2000 are based on results from the 1998 census. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the South model of the Coale-Demeny Model Life Tables. Estimates from the 1987 and 1998 censuses and official estimates from the National Statistical Office of Malawi were also considered. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR and on data on the number of migrant workers in South Africa.

MALAYSIA

Total population (2005): Estimated to be consistent with the 2000 census and with

estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates through 2000.
Infant and child mortality: Based on births and infant deaths registered through 2005.
Life expectancy at birth: Based on official estimates of life expectancy available through 2005 (preliminary).
International migration: Based on data on estimates of derived as the difference between overall population growth and natural increase during the 1991-2000 intercensal period inflows and outflows of refugees and on information on Malaysian emigrants admitted by the main countries of immigration.

MALDIVES

Total population (2005): Estimated to be consistent with the age and sex structure of the 2000 census, total population of the 2006 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 1985, 1990, 1995 and 2000 censuses and (b) the crude birth rate and the number of births registered through 2003.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 2000 census and official infant mortality estimates through 2005.
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables. Official estimates were also considered.
International migration: Net international migration was assumed to be zero.

MALI

Total population (2005): Estimated to be consistent with the 1987 census, the preliminary results of the 1998 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data and children ever born from the 1987, 1995-1996 and 2001 Mali DHS.
Infant and child mortality: Infant mortality estimates are derived from the child mortality rates using INDEPTH Pattern 1 relational model (INDEPTH Network, 2004. INDEPTH Model Life Tables for Sub-Saharan Africa. Table 4.2, p. 24). Child mortality estimates are based on: (a) the South model of the Coale-Demeny Model Life Tables and data on children ever born and surviving classified by age of mother from the 1987 census and the 1987, 1995-1996 and 2001 Mali DHS; and (b) recent deaths from the same sources and 1976 and 1998 censuses. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Estimated with INDEPTH Pattern 1 relational model (INDEPTH Network, 2004. INDEPTH Model Life Tables for Sub-Saharan Africa. Table 4.2, p. 24) using two parameters: (1) direct and indirect estimates of child mortality and (2) adjusted estimates of adult mortality (45q15) derived from (a) recent household deaths data from the 1976, 1987 and 1998 censuses, (b) orphanhood data from the 1987 census and 1995-1996 Mali DHS and (c) siblings deaths from the 1995-1996 and 2001 Mali DHS. Data from other local surveys (1981-1982 multiround rural survey and 1985 urban survey) were also considered. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR, on the number of Malians enumerated in other countries of the region and on the results of the REMUAO surveys carried out by CERPOD.

MALTA

Total population (2005): Estimated to be consistent with the 1995 census, with estimates of the subsequent trends in fertility, mortality, international migration and with the preliminary total population of the 2005 census.
Total fertility: Based on official estimates of total fertility through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2004.

Life expectancy at birth: Based on official estimates of life expectancy derived from registered deaths and available through 2004. The age pattern of mortality was based on the average of life tables for the period 1995-1998 smoothed to remove fluctuations caused by small numbers.
International migration: Based on official estimates of international migration registered through 2004 and the difference between overall population growth and natural increase during the 1995-2005 intercensal period.

MARSHALL ISLANDS

Total population (2005): Estimated to be consistent with the 1999 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on an application of the P/F ratio method to data on children ever born and births during the year preceding the 1999 census.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 1999 census.
Life expectancy at birth: Based on: (a) the estimated level of infant and child mortality; (b) tabulations of parental survivorship (orphanhood) by age of respondent from the 1999 census; and (c) by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1988-1999 intercensal period.

MARTINIQUE

Total population (2005): Estimated to be consistent with the 1999 census, with official population estimates for 2003 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2003.
Infant and child mortality: Based on births and infant deaths registered through 2003.
Life expectancy at birth: Based on: (a) a life table for 1989-1991 derived from registered deaths by age and sex and the 1990 mid-year population by age and sex and (b) an estimate of life expectancy from deaths registered through 2003.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1990-1999 intercensal period.

MAURITANIA

Total population (2005): Estimated to be consistent with the 2000 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1981-1982 Fertility Survey of Mauritania (WFS), 1990-1991 Maternal Child and Health Survey, the 2000-2001 Mauritania DHS and the 2003-2004 Mauritania Infant Mortality and Malaria Survey (EMIP).
Infant and child mortality: Based on data on children ever born and surviving from the 1977 and 1988 censuses, the 1981-1982 Fertility Survey of Mauritania (WFS), the 1990-1991 Maternal Child and Health Survey, the 1996 Mauritania MICS, the 2000-2001 Mauritania DHS and the 2003-2004 Mauritania Infant Mortality and Malaria Survey (EMIP).
Life expectancy at birth: Estimated with INDEPTH Pattern 1 relational model (INDEPTH Network, 2004. INDEPTH Model Life Tables for Sub-Saharan Africa. Table 4.2, p. 24) using two parameters: (1) direct and indirect estimates of child mortality and (2) adjusted estimates of adult mortality (45q15) derived from (a) recent household deaths data from the 1977 and 1988 censuses, (b) parental orphanhood from the 1981-1982 Fertility Survey of Mauritania (WFS) and (c) siblings deaths from the 2000-2001 Mauritania.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1988-2000 intercensal period.

MAURITIUS[9]

Total population (2005): Estimated to be consistent with official population estimates for 2004 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2004 classified by age of mother.
Infant and child mortality: Based on births and infant deaths registered through 2004.
Life expectancy at birth: Based on official estimates of life expectancy available through 2003. The age pattern of mortality is based on an official life table for 1999-2001.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1990-2000 intercensal period and on reported arrivals and departures of resident population through 2002.

MEXICO

Total population (2005): Estimated to be consistent with the 2005 census adjusted upward by 1.4 per cent due to under enumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) births registered through 2000 classified by age of mother; (b) maternity-history data from the 1987 Encuesta Nacional sobre Fecundidad y Salud (DHS), the 1992 Encuesta Nacional de la Dinámica Demográfica (ENADID) and the 1995 Encuesta Nacional de Planificación Familiar and (c) preliminary data on children ever born from the 2000 census.
Infant and child mortality: Based on: (a) maternity-history data from the 1992 Encuesta Nacional de la Dinámica Demográfica (ENADID) and (b) data on children ever born and surviving classified by age of mother from the 2000 census.
Life expectancy at birth: Based on a life table for 1999-2000 derived from: (a) registered deaths by age and sex for 1999 and 2001 and the 2000 census population by age and sex; and (b) estimates of infant and child mortality.
International migration: Based on estimates derived from: (a) the number and characteristics of the population born in Mexico and enumerated by the censuses of the United States of America and (b) statistics compiled by the Immigration and Naturalization Service of the United States on the number of Mexicans admitted legally to that country and adjusted for undocumented migration. Also the 2005 Mexican census was consulted.

MICRONESIA (FEDERAL STATES OF)

Total population (2005): Estimated to be consistent with the 2000 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 2000 census.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 2000 census.
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1994-2000 intercensal period.

MONACO

Total population (2005): Estimated to be consistent with the 2000 census and with estimates of the subsequent trends in fertility, mortality and international migration.

MONGOLIA

Total population (2005): Estimated to be consistent with the 2000 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2004.

Infant and child mortality: Based on the WHO estimates of 2003, in which the levels of mortality were similar to that in 1998.
Life expectancy at birth: Based on the 1998 estimates of WHO.
International migration: Based on information on migration flows in and out of Mongolia from the 2000 census, on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1989-2000 intercensal period and on assumptions from official population projections.

MONTENEGRO

Total population (2005): Estimated to be consistent with the 2003 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2003.
Infant and child mortality: Based on births and infant deaths registered through 2003.
Life expectancy at birth: Based on official estimates of life expectancy available through 2003.
International migration: Based on refugee statistics compiled by UNHCR and on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1991-2003 intercensal period.

MONTSERRAT

Total population (2005): Estimated to be consistent with the 2001 census and with estimates of the subsequent trends in fertility, mortality and international migration.

MOROCCO

Total population (2005): Estimated to be consistent with the 2004 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1987 and 1992 Enquêtes Nationales sur la Population et la Santé (ENPS-I and II/DHS), the 1986-88 Enquête Nationale Démographique à Passages Répétés (ENDPR), the 1995 Enquête de Panel sur la Population et la Santé (EPPS/DHS), the 1998-1999 Living Standards Survey, the 1996-97 and 2003-04 PAPCHILD Surveys of Morocco (ENSME and EPSF) and estimates derived from the 1994 and 2004 censuses.
Infant and child mortality: Based on: (a) data on children ever born and surviving classified by age of mother from the 1980 World Fertility Survey, the 1982 census, the 1987 and 1992 Enquêtes Nationales sur la Population et la Santé (ENPS-I and II/DHS), the 1995 Enquête de Panel sur la Population et la Santé (EPPS/DHS), the 2003-04 PAPCHILD Survey of Morocco (EPSF) and (b) estimates from UNICEF.
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality initially conforms to the South model of the Coale-Demeny Model Life Tables, while subsequently converging towards the East model.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1982-1994 and 1994-2004 intercensal periods.

MOZAMBIQUE

Total population (2005): Estimated to be consistent with the 1997 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 1997 census; (b) maternity-history data from the 1997 and 2003 Mozambique DHS; (c) estimates derived from the 2002-2003 Inquérito de Agregados Familiares and (d) official estimates through 2005.
Infant and child mortality: Infant mortality estimates for the period 2000-2005 are based on official estimates from INE-Mozambique and direct estimates from the 2003 DHS. Child mortality estimates are based on: (a) data on children ever-born and surviving classified by age of mother from the 1997 census, (b)

maternity-history data from the 1997 and 2003 Mozambique DHS (direct and indirect estimates) and (c) estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. Official estimates from the 1997 census were also considered. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR, data on migration of workers to South Africa and on the results of the 1997 census regarding persons residing abroad five years before the enumeration.

MYANMAR

Total population (2005): Estimated to be consistent with the 1983 census, with official population estimates for 1997 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on data from the 2001 and 1997 Fertility and Reproductive Health Surveys and the 1991 Myanmar Population Change and Fertility Survey. Levels were adjusted to produce an estimated population for 1997 that is close to the official estimate.
Infant and child mortality: Based on maternity-history data from the 1997 Fertility and Reproductive Health Survey and the 1991 Myanmar Population Change and Fertility Survey. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on the life tables and infant mortality estimates produced by the 1991 Myanmar Population Change and Fertility Survey, assuming that the age pattern of mortality conforms to the Latin American model of the United Nations Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR and assumed trends in labour migration.

NAMIBIA

Total population (2005): Estimated to be consistent with the 1991 and 2001 censuses, adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) official total fertility estimates from Statistics Namibia derived from the 1991 and 2001 censuses and (b) maternity-history data from the 1992 and 2000 Namibia DHS.
Infant and child mortality: Based on: (a) official estimates from Statistics Namibia derived from the 2001 census; (b) data on children ever born and surviving from the 1992 and 2000 Namibia DHS; and (c) estimates from UNICEF. Adjustments were made while taking into account the official life expectancy estimates and considering the impact of AIDS. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables. Official estimates from Statistics Namibia were also considered. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR and assumed immigration levels.

NAURU

Total population (2005): Estimated to be consistent with the 1992 census and with estimates of the subsequent trends in fertility, mortality and international migration.

NEPAL

Total population (2005): Estimated to be consistent with the 2001 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 1991

and 2001 censuses and (b) the 1996 Nepal Family Health Survey and the 2001 Nepal DHS, adjusted for underreporting.
Infant and child mortality: Infant mortality estimates are derived from the child mortality rates using the West model of the Coale-Demeny Model Life Tables and are consistent with national and UNICEF estimates. Child mortality estimates are based on: (a) data on children ever-born and surviving classified by age of mother and (b) maternity-history data from the 1996 Nepal Family Health Survey and the 2001 Nepal DHS.
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables.
International migration: Based on: (a) information on household members abroad gathered by the 1981, 1991 and 2001 censuses and (b) information on refugee flows to and from the country.

NETHERLANDS

Total population (2005): Estimated to be consistent with official population estimates for 2005.
Total fertility: Based on official estimates of total fertility through 2005.
Infant and child mortality: Based on births and infant deaths registered through 2005.
Life expectancy at birth: Based on official estimates of life expectancy derived from registered deaths through 2005. The age pattern of mortality is based on an official life tables for 1995 to 2000.
International migration: Based on official estimates of international migration available through 2004.

NETHERLANDS ANTILLES

Total population (2005): Estimated to be consistent with the 2001 census, national estimates through 2004 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2004.
Life expectancy at birth: Based on an official life table for 2002-2004. The age pattern of mortality is based on an official life table for 2001-2003.
International migration: Based on official data on international migration through 2004.

NEW CALEDONIA

Total population (2005): Estimated to be consistent with the 2004 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on total fertility estimates though 2005.
Infant and child mortality: Based on births and infant deaths registered through 2005.
Life expectancy at birth: Based on: (a) a life table for 1995-1997 derived from registered deaths classified by age and sex and on the underlying population by age and sex; (b) on the assumption that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables; and (c) on official estimates of life expectancies at birth through 2004.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1996-2004 intercensal period.

NEW ZEALAND

Total population (2005): Estimated to be consistent with official population estimates for 2005.
Total fertility: Based on official estimates of total fertility and age-specific fertility derived from registered births available through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2005.
Life expectancy at birth: Based on an official life table for 2003-2005. The age pattern of mortality is based on an official life table for 1995-1997.
International migration: Based on official estimates of international migration and estimates derived as the difference between overall population growth and natural increase through 2005.

NICARAGUA

Total population (2005): Estimated to be consistent with the 2005 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 2005 census and (b) maternity-history data from the 1998 and 2001 Encuesta Nicaraguense de Demografía y Salud (ENDESA/DHS).
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 2005 census and the 1998 and 2001 Nicaragua DHS (ENDESA).
Life expectancy at birth: Based on: (a) a life table derived from the deaths in the past year recorded by the 2005 census; (b) vital statistics through 2005; and (c) infant and child mortality estimates from the 1995 and 2005 census and the 1998 and 2001 Nicaragua DHS (ENDESA).
International migration: Based on border statistics, the 2005 census and other administrative statistics of Nicaragua and from the number and characteristics of persons born in Nicaragua and enumerated by the 1988 census of Honduras and the 1990 and 2000 census of the United States of America and the 2000 census of Costa Rica and on estimates of net international migration derived as the difference between overall population growth and natural increase during each intercensal period.

NIGER

Total population (2005): Estimated to be consistent with the 1988 and 2001 censuses and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on data on children ever born and births in the preceding 12 months, both classified by age of mother and maternity-history data from the 1992, 1998 and 2006 Niger DHS and the 2000 Niger Multiple Indicator Cluster Survey (MICS-2). Adjustments were made for the underreporting of births. Estimates based on data from the 1988 and 2001 censuses were also considered.
Infant and child mortality: Infant mortality estimates are derived from the child mortality rates using INDEPTH Pattern 1 relational model (INDEPTH Network, 2004. INDEPTH Model Life Tables for Sub-Saharan Africa. Table 4.2, p. 24). Child mortality estimates are based on: (a) the South model of the Coale-Demeny Model Life Tables and data on children ever born and surviving classified by age of mother from the 1992, 1998 and 2006 Niger DHS and the 2000 Niger MICS-2; and (b) recent deaths from the same sources and 1988 and 2001 censuses. Estimates based on the 1996 Niger MICS were also considered. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Estimated with INDEPTH Pattern 1 relational model (INDEPTH Network, 2004. INDEPTH Model Life Tables for Sub-Saharan Africa. Table 4.2, p. 24) using two parameters: (1) direct and indirect estimates of child mortality and (2) adjusted estimates of adult mortality (45q15) derived from (a) recent household deaths data from the 1988 and 2001 censuses, (b) parental orphanhood from the 1992 and 1998 Niger DHS and (c) siblings deaths from the 1992 and 2006 Niger DHS. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1988-2001 intercensal period.

NIGERIA

Total population (2005): Estimated to be consistent with the age and sex structure of the 1991 census adjusted for underenumeration, the 2006 census preliminary totals, as well as with intercensal estimates of the trends in fertility, mortality and international migration.
Total fertility: Based on data on children ever born and births in the preceding 12 months, both classified by age of mother and maternity-history data from the 1990, 1999 and 2003 Nigeria DHS. Adjustments were made for the underreporting of births. National estimates from

the 1991 census and the 1994 and 2000 Nigeria Sentinel Surveys were also considered.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 1990 and 2003 Nigeria DHS. Estimates based on the 1995 and 1999 Nigeria Multiple Indicator Cluster Surveys, the 1999 Nigeria DHS and 2000 Nigeria Sentinel survey were also considered. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on information on Nigerian-born persons enumerated in neighbouring countries, flows of Nigerians to selected developed countries and information obtained at the time of the repatriation of undocumented migrants that took place in 1983 and 1985.

NIUE

Total population (2005): Estimated to be consistent with the 2001 census and with estimates of the subsequent trends in fertility, mortality and international migration.

NORTHERN MARIANA ISLANDS

Total population (2005): Estimated to be consistent with the 2000 census and with estimates of the subsequent trends in fertility, mortality and international migration.

NORWAY[10]

Total population (2005): Estimated to be consistent with official population estimates for 2006.
Total fertility: Based on official estimates of total fertility through 2006.
Infant and child mortality: Based on births and infant deaths registered through 2005.
Life expectancy at birth: Based on official estimates of life expectancy available through 2005.
International migration: Based on official estimates of international migration and estimates derived as the difference between overall population growth and natural increase through 2005.

OCCUPIED PALESTINIAN TERRITORY

Total population (2005): Estimated to be consistent with the 1997 census and with estimates of the subsequent trends in fertility, mortality and international migration. Population figures include the Arab population residing in East Jerusalem and exclude Israeli citizens residing in the Occupied Palestinian Territory. Official population estimates for the year 2000 and 2005 from the Palestinian Central Bureau of Statistics were also taken into account.
Total fertility: Based on official estimates of total fertility for 1997, 1999 and 2003 produced by the Palestinian Central Bureau of Statistics. The 2003 estimate is based on the results of 2004 Demographic and Health Survey and the 1997 estimate is derived by applying the P/F ratio method using births in the year preceding the 1997 census and average parity as measured by the census.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 1995 Demographic Survey and from the 2000 Health Survey in the Palestinian Territory. Estimates from UNICEF were also taken into account.
Life expectancy at birth: Based on official estimates for 1997-1999 and 2001 produced by the Palestinian Central Bureau of Statistics.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 2000-2005 period.

OMAN

Total population (2005): Estimated to be consistent with the 1993 and 2003 censuses, adjusted for underenumeration and with

estimates of the subsequent trends in fertility, mortality and international migration. Official population estimates for the years 2000, 2004 and 2005 were also considered.
Total fertility: Based on official estimates of total fertility for the period 2000-2005 provided by the Omani Ministry of Health.
Infant and child mortality: Based on official estimates of infant and child mortality for 2000-2002 provided by the Omani Ministry of Health.
Life expectancy at birth: Based on official life expectancy estimates provided by the Omani Ministry of National Economy and WHO.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1993-2003 intercensal period. Official population estimates for the years 2000, 2004 and 2005 were also considered for the estimation of the net migration levels.

PAKISTAN

Total population (2005): Estimated to be consistent with the 1981 and 1998 censuses and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on estimates from the 1996-1997 Pakistan Fertility and Family Planning Survey, the 2000-2001 Pakistan Reproductive Health and Family Planning Survey, the Pakistan Demographic Survey (PDS) from 1984 up to 2003 and from previous surveys and censuses.
Infant and child mortality: Based on: (a) data on children ever born and surviving classified by age of mother, from the 1975 PFS, 1984-1985 CPS, 1990-1991 Pakistan DHS, 2000-01 Pakistan RHFPS; (b) births and infant deaths in the preceding 12 months from the 1984-2003 Pakistan Demographic Surveys; and (c) maternity-history data for 1982-1990 from the 1990-1991 Pakistan DHS and for 1990-1999 from the 2000-2001 Pakistan Reproductive Health and Family Planning Survey.
Life expectancy at birth: Based on: (a) life tables derived from the 1984-2003 Pakistan Demographic Surveys and adjusted for underreporting of deaths and (b) derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the South-Asian model of the United Nations Model Life Tables.
International migration: Based on information on the outflow of migrant workers, on data on Pakistani immigrants admitted by the main countries of immigration and data on refugee flows compiled by UNHCR.

PALAU

Total population (2005): Estimated to be consistent with the 2005 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2000 classified by age of mother.
Infant and child mortality: Based on official estimates of infant mortality available through 2002.
Life expectancy at birth: Based on: (a) the estimated level of infant and child mortality and (b) the estimated level of adult mortality derived from data on parental survivorship (orphanhood) by age of respondent from the 2000 census.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 2000-2005 intercensal period.

PANAMA

Total population (2005): Estimated to be consistent with the 2000 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2000 and preliminary data from the 2000 census, classified by age of mother.
Infant and child mortality: Based on: (a) data on children ever born and surviving classified by age of mother from the 2000 census and (b) births and infant deaths registered through 2000.
Life expectancy at birth: Based on a life table for 1999-2000 derived from: (a) registered deaths by age and sex for 1999-2000 adjusted for underregistration by using the growth-balance method and the 2000 census population by age

and sex and (b) estimates of infant and child mortality when available.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1990-2000 intercensal period. Also, counts of foreign-born from Panama residing in other countries in Latin America and the United States of America were considered from the 1990 and 2000 census rounds.

PAPUA NEW GUINEA

Total population (2005): Estimated to be consistent with the 2000 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on an application of the P/F ratio method to data on children ever born and births during the year preceding the 2000 census.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 2000 census and child mortality estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on: (a) the estimated level of infant and child mortality; (b) tabulations of parental survivorship (orphanhood) by age of respondent from the 2000 census; and (c) by assuming that the age pattern of mortality conforms to the Far Eastern model of the United Nations Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1990-2000 intercensal period.

PARAGUAY

Total population (2005): Estimated to be consistent with the 2002 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) maternity-history data from the 1990 Encuesta Nacional de Demografía y Salud (ENDS/DHS) and the 1995-1996 Encuesta Nacional de Demografía y Salud Reproductiva; (b) on fertility data from the 1998 Encuesta Nacional de Salud Materno-Infantil; and (c) data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 2002 census.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 2002 and 1992 census and the 1995/1996 National Demographic and Reproductive Health Survey.
Life expectancy at birth: Based on a life table for 1991-1993 derived from: (a) registered deaths by age and sex for 1991-1993 adjusted for underregistration by using the growth-balance method and the 1992 census population by age and sex; (b) deaths by age and sex estimated from the 1995-1996 Encuesta National de Demografía y Salud Reproductiva (ENDS); and (c) data about children ever born and births in the preceding 12 months, both classified by age of mother from the 2002 census.
International migration: Based on estimates of net international migration available through 2002 calculated from border statistics, the number of persons born in Paraguay and enumerated by the censuses of Argentina and the United States of America and other administrative statistics from the 1990 and 2000 census rounds.

PERU

Total population (2005): Estimated to be consistent with the 2005 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1991-1992, 1996, 2000 and 2004 Encuestas Demográficas y de Salud Familiar (ENDES-II, III and IV/DHS) and on data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 1993 census.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 1991-1992, 1996 and

2000 Encuestas Demográficas y de Salud Familiar (ENDES/DHS) and the 1993 census.
Life expectancy at birth: Based on a life table for 1991-1992 derived from: (a) registered deaths by age and sex for 1991-1992 adjusted for underregistration by using the growth-balance method and the 1993 census population by age and sex and (b) the estimated level of infant and child mortality.
International migration: Net international migration was estimated for 1982-1990 from border statistics and other administrative statistics and from the number and characteristics of persons born in Peru and enumerated during the 1990 and 2000 round of census counts in Argentina, Canada, Chile, Venezuela and the United States of America.

PHILIPPINES

Total population (2005): Estimated to be consistent with the 1995 and 2000 censuses and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1993 National Demographic Survey, the 1998 DHS, the 2003 DHS and official data on total fertility through 2004 and consistent with the age distributions produced by the 1990, 1995 and 2000 census counts.
Infant and child mortality: Based on maternity-history data from the 1993 National Demographic Survey and the 1998 and 2003 Philippines DHS. Child mortality estimates from UNICEF were also considered.
Life expectancy at birth: Based on a life table for 1987-1989 derived from registered deaths by age and sex for 1987-1989, adjusted for underregistration and the underlying population by age and sex.
International migration: Based on data on Filipino emigrants admitted by the main countries of immigration, from data on clearances of Filipino workers and taking into account refugee flows. Levels were adjusted to be compatible with intercensal population change once fertility and mortality were taken into account.

PITCAIRN

Total population (2005): Estimated to be consistent with the 1991 census, with a 1999 official population figure provided to the United Nations General Assembly (UN Document Symbol: A/AC.109/2002/2) and with estimates of the subsequent trends in fertility, mortality and international migration.

POLAND

Total population (2005): Estimated to be consistent with the 2002 census, with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility through 2004.
Infant and child mortality: Based on official estimates of infant mortality available through 2005.
Life expectancy at birth: Based on official estimates of life expectancy available through 2005. The age pattern of mortality is based on official life tables through 2005.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase through 2005.

PORTUGAL

Total population (2005): Estimated to be consistent with the 2001 census, with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2003.
Life expectancy at birth: Based on official estimates of life expectancy available through 2003. The age pattern of mortality is based on an official life table for 1996-1997.
International migration: Based on official estimates of international migration and estimates of net international migration derived as the difference between overall population growth and natural increase through 2004.

PUERTO RICO

Total population (2005): Estimated to be consistent with the 2000 census, with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility through 2005.
Infant and child mortality: Based on births and infant deaths registered through 2003.
Life expectancy at birth: Based on official life tables available for 1992-1994 and official estimates of life expectancy available through 2005.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1990-2000 intercensal period and estimates of net flows for Puerto Rico from the US Census Bureau.

QATAR

Total population (2005): Estimated to be consistent with the 1997 and 2004 censuses and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered in 2004, classified by age of mother and the estimated number of women in 2004.
Infant and child mortality: Based on births and infant and child deaths registered through 2004.
Life expectancy at birth: Based on official estimates of life expectancy prepared by the Planning Council of Qatar and WHO. Levels for males were slightly adjusted in order to reproduce more consistent trends.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1986-1997 and 1997-2004 intercensal periods.

REPUBLIC OF KOREA

Total population (2005): Estimated to be consistent with the 2000 census, with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2003.
Life expectancy at birth: Based on an official life table for 1995 and official estimates of life expectancy through 2003.
International migration: Based on estimates of migration of Koreans to the main countries of immigration and on labour migration statistics of the Republic of Korea.

REPUBLIC OF MOLDOVA

Total population (2005): Estimated to be consistent with the 1989 census, with reported total population from the 2004 censuses of the Republic of Moldova and the region of Transnistria and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2004 and on maternity-history data from the 2005 Moldova DHS.
Infant and child mortality: Based on births and infant deaths registered through 2004, adjusted to compensate for infant deaths omitted owing to the use, prior to 1991, of a definition of infant death that did not conform to international standards. Adjustments are still thought necessary although the definition of infant death has been changed. Maternity-history data from the 2005 DHS were also considered.
Life expectancy at birth: Based on official estimates of life expectancy available through 2004, adjusted to take into account underreporting of infant and child mortality. The age pattern of mortality is derived from a life table constructed on the basis of 2003 data.
International migration: Based on estimates of net international migration derived as the difference between overall population change and natural increase during the 1989-2004 intercensal period.

RÉUNION

Total population (2005): Estimated to be consistent with the 2004 census and with

estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2004.
Life expectancy at birth: Based on official estimates of life expectancy available through 2004. The age pattern of mortality is based on an official life table for 1980-1984 that was derived from registered deaths by age and sex and from the 1982 census population by age and sex.
International migration: Based on official estimates of net international migration (from passenger data) available through 2002.

ROMANIA

Total population (2005): Estimated to be consistent with the 2002 census, with an official population estimate by age and sex for 1 July 2004, with an official estimate of total population for 1 July 2005 and with estimates of trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2004.
Life expectancy at birth: Based on official estimates of life expectancy available through 2002-2004. The age pattern of mortality is based on an official life table for 1996-1998.
International migration: Based on estimates of net international migration derived as the difference between overall population change and natural increase through 2005.

RUSSIAN FEDERATION

Total population (2005): Estimated to be consistent with the 2002 census, with official population estimates for 1 January 2005 and 1 January 2006 and with estimates of trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2005 and estimates from UNICEF that reflect an adjustment for underregistration of infant deaths. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on official estimates of life expectancy available through 2005. The age pattern of mortality is based on life tables through 2005 from the Human Mortality Database. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on estimates of net international migration derived as the difference between overall population change and natural increase through 2005.

RWANDA

Total population (2005): Estimated to be consistent with the 2002 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) estimates derived from data on children ever born and births in the previous three years, both classified by age of mother, from the 1992, 2000 and 2005 Rwanda DHS and (b) data on children ever born by age of mother from the 1996 Socio-Demographic Survey.
Infant and child mortality: Based on data on children ever born and surviving from the 1996 Socio-Demographic Survey, adjusted to reflect the effects of the 1993-1994 civil war and from the 2000 and 2005 Rwanda DHS. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on the estimated level of infant mortality and taking into account the unusual numbers of deaths caused by the 1993-1994 civil war. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR.

SAINT HELENA[11]

Total population (2005): Estimated to be consistent with the 1998 census and with estimates of the subsequent trends in fertility, mortality and international migration.

SAINT KITTS AND NEVIS

Total population (2005): Estimated to be consistent with the 2001 census and with estimates of the subsequent trends in fertility, mortality and international migration.

SAINT LUCIA

Total population (2005): Estimated to be consistent with the 2001 census, with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility through 2001.
Infant and child mortality: Based on births and infant deaths registered through 2001 and UNICEF estimates.
Life expectancy at birth: Based on official estimates of life expectancy available through 2001. The age pattern of mortality is based on a life table for 1989 derived from registered deaths by age and sex and the underlying population by age and sex derived from the 1991 census.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the intercensal period 1991-2001.

SAINT PIERRE ET MIQUELON

Total population (2005): Estimated to be consistent with the 1999 census and with estimates of the subsequent trends in fertility, mortality and international migration.

SAINT VINCENT AND THE GRENADINES

Total population (2005): Estimated to be consistent with the 1991 census, the preliminary total population from the 2001 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births classified by age of mother registered through 1992 and official estimates of total fertility for 1999 and 2000.
Infant and child mortality: Based on births and infant deaths registered through 1992 and UNICEF estimates.
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables. WHO life expectancy values were also considered.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the intercensal period 1991-2001.

SAMOA

Total population (2005): Estimated to be consistent with the 2001 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 2001 census.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 1999 Samoa DHS.
Life expectancy at birth: Based on: (a) reported deaths by age and sex for 1997 and 1998 from the 1999 Samoa DHS and the underlying population and (b) the assumption that the age pattern of mortality conforms to the Far Eastern model of the United Nations Model Life Tables. The age pattern of mortality derived from the DHS data could not be accepted because of the random variations associated with small numbers.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1991-2001 intercensal period.

SAN MARINO

Total population (2005): Estimated to be consistent with official population estimates for 1950-2004 and with estimates of the subsequent trends in fertility, mortality and international migration.

SAO TOME AND PRINCIPE

Total population (2005): Estimated to be consistent with the 1991 and 2001 censuses and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Total fertility: Based on official estimates of total fertility derived from the 2001 census.
Infant and child mortality: Based on maternity-history data from the 2000 Sao Tome and Principe Multiple Indicator Cluster Survey (MICS) and estimates from UNICEF.
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the South model of the Coale-Demeny Model Life Tables. Official estimates derived from the 2001 census and from WHO were also taken into account.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1991-2001 intercensal period.

SAUDI ARABIA

Total population (2005): Estimated to be consistent with the 2004 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on data on children ever born and births in the preceding 12 months classified by age of mother from the 2004 census and estimates prepared by ESCWA. Census estimates were adjusted upwards by applying the P/F ratio method.
Infant and child mortality: Based on estimates from UNICEF. Estimates derived from the 2004 census life tables were also taken into account.
Life expectancy at birth: Based on a life table for 2004 derived from the number of deaths, classified by age and sex, during the 12 months preceding the 2004 census and on the enumerated population. The levels of life expectancy were adjusted for the under-reporting of deaths by considering the official estimates from WHO. The age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1992-2004 intercensal period, taking into account the return of Yemeni citizens to their country during the aftermath of the Gulf War.

SENEGAL

Total population (2005): Estimated to be consistent with the 1988 and 2002 censuses and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on (a) data from the 1988 census on births in the preceding 12 months classified by age of mother and (b) data on children ever born and births in the preceding 12 months, both classified by age of mother and maternity-history data from the 1978 WFS and the 1986, 1992-1993, 1997 and 2005 DHS and the 1999 Senegal ESIS.
Infant and child mortality: Infant mortality estimates are derived from the child mortality rates using INDEPTH Pattern 1 relational model (INDEPTH Network, 2004. INDEPTH Model Life Tables for Sub-Saharan Africa. Table 4.2, p. 24). Child mortality estimates are based on: (a) the South model of the Coale-Demeny Model Life Tables and data on children ever born and surviving classified by age of mother from the 1978 WFS, the 1986, 1992-1993, 1997 and 2005 DHS, the 1996 MICS and the 1999 Senegal ESIS; and (b) recent deaths from the same sources, the 1978-1979 Multiround Survey and the 2000 MICS.
Life expectancy at birth: Estimated with INDEPTH Pattern 1 relational model (INDEPTH Network, 2004. INDEPTH Model Life Tables for Sub-Saharan Africa. Table 4.2, p. 24) using two parameters: (1) direct and indirect estimates of child mortality and (2) adjusted estimates of adult mortality (45q15) derived from (a) recent household deaths data from the 1978-1979 Multiround Survey and the 1988 census, (b) parental orphanhood from the same sources, the 1986 DHS and (c) siblings deaths from the 1992-1993 and 2005 Senegal DHS. Data for demographic surveillance sites

(Bandafassi, Mlomp, Niakhar, N'gayokhème) were also considered.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1988-2002 intercensal period.

SERBIA

Total population (2005): Estimated to be consistent with the 1981 census, adjusted to reflect the de facto population and with estimates of the subsequent trends in fertility, mortality and international migration. Data from the 2002 census of Serbia, the 2003 census of Montenegro and national estimates for 2003 were also considered.
Total fertility: Based on official estimates of total fertility available through 2003.
Infant and child mortality: Based on births and infant deaths registered through 2001.
Life expectancy at birth: Based on official estimates of life expectancy available through 2004. The age pattern of mortality is based on an official life table for 1997.
International migration: Based on refugee statistics compiled by UNHCR.

SEYCHELLES

Total population (2005): Estimated to be consistent with the 2002 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2003.
Infant and child mortality: Infant mortality estimates are based on official data from the National Statistics Office. Child mortality estimates are derived from the infant mortality rates using the Far Eastern model of the Coale-Demeny Model Life Tables.
Life expectancy at birth: Based on official estimates of life expectancy available through 2003.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase.

SIERRA LEONE

Total population (2005): Estimated to be consistent with the 1985 census adjusted for underenumeration, the age and sex structure of the 2003 pilot census and the 2003 census totals, as well as with intercensal estimates of the trends in fertility, mortality and international migration.
Total fertility: Based on data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 1985 census and the 2003 pilot census. Estimates based on the 1992 Demographic and Social Monitoring survey and the 2000 Sierra Leone Multiple Indicator Cluster Survey (MICS-2) were also considered.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 1985 census and the 2003 pilot census. Results from the 2000 Sierra Leone MICS were also considered. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the South model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR.

SINGAPORE

Total population (2005): Estimated to be consistent with the 2000 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2005.
Infant and child mortality: Based on births and infant deaths registered through 2005.
Life expectancy at birth: Based on official estimates of life expectancy available for 1980-2005.
International migration: Based on intercensal estimates taking into account changes in both the number of permanent residents and non-residents.

SLOVAKIA

Total population (2005): Estimated to be consistent with the 2001 census, with official population estimates for 31 December 2004 and 31 December 2005 and with estimates of trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2005.
Life expectancy at birth: Based on life tables through 2005 available from the Human Mortality Database.
International migration: Based on estimates of net international migration derived as the difference between overall population change and natural increase through 2005.

SLOVENIA

Total population (2005): Estimated to be consistent with the 2002 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2004.
Life expectancy at birth: Based on official estimates of life expectancy available through 2004. The age pattern of mortality is based on an official life table for 1993-1994.
International migration: Based on official estimates of international migration available through 2002.

SOLOMON ISLANDS

Total population (2005): Estimated to be consistent with the 1999 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) the own-children method applied to the 1976 and 1986 censuses; (b) maternity-history tabulations from the 1995 KAP Survey (Knowledge, Attitude and Practices); and (c) data on children ever born and births in the past 12 months from the 1999 census.
Infant and child mortality: Based on official estimates using the census and regression analysis.
Life expectancy at birth: Based on: (a) data on children ever born and surviving from the 1986 and 1999 censuses; (b) official estimates based on census analysis; and (c) the assumption that the pattern of mortality conforms to the West model of the United Nations Model Life Tables. Indirect estimation permits the construction of a life table referring to the period 1980-1984.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the intercensal period 1986-1999.

SOMALIA

Total population (2005): Estimated to be consistent with the 1975 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration. Estimates from the 2002 Somalia Socio-Economic Survey were also considered and adjusted upwardly.
Total fertility: Based on: (a) the 1980-1981 National Survey of Population; (b) the provisional results from the 1986-1987 census for Mogadishu; (c) the 1999 Safe Motherhood Baseline Survey conducted in the North-West region of Somalia; (d) the 1999 Reproductive Health Survey conducted in the North-West and North-East regions of Somalia; and (e) data on children ever born from the 1999 Somalia Multiple Indicator Cluster Survey (MICS-1). Estimates were adjusted while taking into account population levels and trends.
Infant and child mortality: Based on the results of the 1999 Somalia MICS and estimates from UNICEF.
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. Estimates from WHO were also considered. Additional deaths due to the famine of 1992 and the war have been factored into the mortality estimates.
International migration: Based on refugee statistics compiled by UNHCR and on estimates

of Somali nationals residing in neighbouring countries.

SOUTH AFRICA

Total population (2005): Estimated to be consistent with the 1996 and 2001 censuses, adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration. The populations of Transkei, Bophuthatswana, Venda and Ciskei are included in the estimates. Official population estimates for the years 2004, 2005 and 2006 from Statistics South Africa were also considered.
Total fertility: Based on official estimates of total fertility from Statistics South Africa, available through 2004.
Infant and child mortality: Based on maternity-history data from the 1998 South Africa DHS. Estimates produced by the Actuarial Society of South Africa and by UNICEF were also considered. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the Far Eastern model of the United Nations Model Life Tables. Official estimates from Statistics South Africa and the Actuarial Society of South Africa were also considered. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on the number of immigrants from South Africa to developed countries, on immigration and emigration statistics for South Africa, on data on migrant workers compiled by the Chamber of Mines, on refugee statistics provided by UNHCR and on estimates of illegal migration to South Africa. Estimates produced by the Actuarial Society of South Africa were also considered.

SPAIN

Total population (2005): Estimated to be consistent with the 2001 census, with official estimates for 2004 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2004.
Life expectancy at birth: Based on official estimates of life expectancy available through 2004. The age pattern of mortality is based on an official life table for 1998-1999.
International migration: Based on official estimates of international migration and estimates derived as the difference between overall population growth and natural increase through 2004.

SRI LANKA

Total population (2005): Estimated to be consistent with the 1981 and 2001 censuses (including estimates for Jaffna, Mannar, Vavuniya, Mullaitivu Killinochchi, Batticaloa and Trincomalee districts) and with intercensal estimates of the trends in fertility, mortality and international migration.
Total fertility: Based on: (a) births classified by age of mother registered through 1997; (b) maternity-history data from the 1975 Sri Lanka WFS, the 1987, 1993 and 2000 Sri Lanka DHS; and (c) official estimates of total fertility through 2000.
Infant and child mortality: Infant mortality estimates are based on: (a) births and infant deaths registered through 2003 and (b) data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 1971 census, the 1975 Sri Lanka WFS, the 1987 and 1993 Sri Lanka DHS (using the West model of the Coale-Demeny Model Life Tables). Child mortality estimates are based on official vital statistics up to 1997 and are consistent with national and UNICEF estimates.
Life expectancy at birth: Based on life tables derived from official estimates of registered deaths and population by age and sex from 1950 to 1997 and adjusted for infant and child mortality.
International migration: Based on: (a) estimates of net international migration derived as the difference between overall population growth and natural increase during the 1963-1981 intercensal period, (b) official estimates of net international migration for 1981-2004 prepared

by the Sri Lanka Department of Census and Statistics and (c) refugee data from UNHCR.

SUDAN

Total population (2005): Estimated to be consistent with the 1983 census, the 1993 census adjusted for the lack of coverage of the population in the Southern provinces and with estimates of the subsequent trends in fertility, mortality and international migration. Official total population estimates for the years 2001, 2003 and 2004 were also considered.
Total fertility: Based on the maternity-history data from the 1989-1990 Sudan DHS, the 1992-1993 SUDMCHS/PAPCHILD and the 1999 Safe Motherhood Surveys of Sudan. Estimates for the year 2001 from the New Sudan Centre for Statistics and Evaluation, for both Northern and Southern Sudan, were also taken into account. There is some uncertainty in the levels and trends of fertility for the whole of Sudan.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 1973 and 1993 censuses, the 1989-1990 Sudan DHS, the 1992-1993 SUDMCHS/PAPCHILD and the 1999 Safe Motherhood Surveys of Sudan. Adjustments were made to take into account the mortality levels in Southern Sudan. There is some uncertainty in the levels and trends of mortality for the whole of Sudan. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR and on estimated levels of labour migration.

SURINAME

Total population (2005): Estimated to be consistent with the 1980 census, preliminary results from the 2004 census, official population estimate for 2000 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 1980, classified by age of mother and estimates of total fertility from the 2004 census.
Infant and child mortality: Based on official estimates of births and infant deaths registered through 2003 adjusted by estimates provided by UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on a life table derived from registered deaths by age and sex for 1979-1981 and on the 1980 census population classified by age and sex and trends implied by registered deaths through 2000. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on official estimates produced by the Netherlands Central Office of Statistics available through 2005.

SWAZILAND

Total population (2005): Estimated to be consistent with the 1997 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) official estimates derived from the 1976, 1986 and 1997 censuses and (b) results from the 1991 Demographic and Housing Survey.
Infant and child mortality: Based on: (a) estimates derived from the derived from the 1976, 1986 and 1997 censuses; (b) estimates from the 2000 Swaziland MICS; and (c) estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR and on information on migrant workers to South Africa.

SWEDEN

Total population (2005): Estimated to be consistent with official population estimates for 2005.
Total fertility: Based on official estimates of total fertility through 2003.
Infant and child mortality: Based on births and infant deaths registered through 2005.
Life expectancy at birth: Based on official estimates of life expectancy available through 2005. The age pattern of mortality is based on an official life table for 2002.
International migration: Based on official estimates of international migration and estimates derived as the difference between overall population growth and natural increase through 2005.

SWITZERLAND

Total population (2005): Estimated to be consistent with the 1990 census, with official population estimates for 2003 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2004.
Infant and child mortality: Based on births and infant deaths registered through 2005.
Life expectancy at birth: Based on official estimates of life expectancy available through 2005. The age pattern of mortality is based on an official life table for 1995-1996.
International migration: Based on official estimates of immigrants and emigrants available through 2005 and assumptions made in official population projections.

SYRIAN ARAB REPUBLIC

Total population (2005): Estimated to be consistent with the 1994 census, the preliminary results of the 2004 census and with estimates of the subsequent trends in fertility, mortality and international migration. Population estimates were slightly adjusted to take into account the influx of Iraqis.
Total fertility: Based on maternity-history data from the 2001 Family Health Survey and the 1993 PAPCHILD Survey of the Syrian Arab Republic. Estimates from ESCWA were also considered.
Infant and child mortality: Based on: (a) data on children ever born and surviving from the 1978 WFS, the 1981 census, the 1993 PAPCHILD Survey, the 1999 Multipurpose Survey and the 2001 Family Health Survey of the Syrian Arab Republic and (b) estimates from UNICEF.
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables. Estimates from ESCWA and WHO were also considered.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1994-2004 intercensal period. Estimates of Iraqis entering Syria because of the war in Iraq have been taken into account.

TAJIKISTAN

Total population (2005): Estimated to be consistent with the 2000 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2000, adjusted for underregistration of births.
Infant and child mortality: Based on estimates from UNICEF that take into account maternity history data and/or data on children ever born and surviving classified by age of mother from the 1999 and 2003 Living Standards Measurement Surveys, the 2000 and 2005 Multiple Indicator Cluster Surveys and the 2002 Demographic Survey.
Life expectancy at birth: Based on reported deaths and population by age and sex through 2000, adjusted for underregistration of deaths.
International migration: Based on estimates of net international migration derived as the difference between overall population change and natural increase during the 1989-2000 intercensal period.

TFYR MACEDONIA[12]

Total population (2005): Estimated to be consistent with the 2002 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility through 2002, adjusted downward to correspond to a de facto definition.
Infant and child mortality: Based on births and infant deaths registered through 2003.
Life expectancy at birth: Based on official estimates of life expectancy available through 2003. The age pattern of mortality is based on an official life table for 1995-1997.
International migration: Based on: (a) statistics on international migration available through 1998 and (b) the difference between overall population growth and natural increase during the intercensal period.

THAILAND

Total population (2005): Estimated to be consistent with the 2000 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on estimates from the 1975 WFS, the 1978, 1981 and 1984 contraceptive prevalence surveys, the 1974-76, 1985-86, 1989, 1991, 1995-1996 Surveys of Population Change, the 1987 Thailand DHS, prior census and survey estimates and official fertility estimates based on vital statistics up to 2000.
Infant and child mortality: Based on: (a) estimates derived from the 1984-86, 1989, 1991, 1995-1996 Surveys of Population Change, (b) maternity-history data from the 1975 WFS and 1987 DHS, (c) data on children ever born and surviving from these surveys, the 1978 and 1981 CPS, 1979 NSMFP survey and 1980, 1990, 2000 censuses, (d) official vital statistics up to 2003 and (e) child mortality estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on adjusted life tables from 1960 to 1995-1996 derived from age-specific death rates obtained from the Surveys of Population Change and other official vital statistics. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR, on information on the number of Thai workers cleared to work abroad, on the estimated stock of foreigners in Thailand and on official statistics on the number of arrivals and departures from Thailand.

TIMOR-LESTE

Total population (2005): Estimated to be consistent with the 2004 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 2003 Timor Leste Demographic and General Health Survey and official fertility estimates derived from the 2004 census data.
Infant and child mortality: Based on: (a) data on children ever born and surviving classified by age of mother from the 2004 census; (b) maternity-history data from the 2003 Timor Leste Demographic and General Health Survey; and (c) estimates from the 2002 Timor Leste Multiple Indicator Cluster Survey.
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables. Official estimates of life expectancy at birth for the year 2002 were also taken into account.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1990-2004 intercensal period and on refugee statistics compiled by UNHCR.

TOGO

Total population (2005): Estimated to be consistent with the 1981 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data and children ever born from the 1988 and 1998 Togo DHS.

Infant and child mortality: Based on data on children ever born and surviving from the 1988 and 1998 Togo DHS. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the South model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR.

TOKELAU

Total population (2005): Estimated to be consistent with the 2001 census and with estimates of the subsequent trends in fertility, mortality and international migration.

TONGA

Total population (2005): Estimated to be consistent with the 1996 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 1996 census and on official estimates through 2003.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 1996 census.
Life expectancy at birth: Based on: (a) the estimated level of infant and child mortality; (b) tabulations of parental survivorship (orphanhood) by age of respondent from the 1996 census; and (c) by assuming that the age pattern of mortality conforms to the Far Eastern model of the United Nations Model Life Tables.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1986-1996 intercensal period.

TRINIDAD AND TOBAGO

Total population (2005): Estimated to be consistent with the 1990 census, preliminary information from the 2000 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on registered births classified by age of mother through 1997 and assumed subsequent trends in fertility.
Infant and child mortality: Based on: (a) births and infant deaths registered through 1997, adjusted for underregistration and to ensure consistency with the empirical life-table and (b) child mortality estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on a life table for 1980-2003 by age and sex. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1980-1990 intercensal period. Also, border statistics of people from Trinidad and Tobago admitted by the United States of America were considered.

TUNISIA

Total population (2005): Estimated to be consistent with the 1994 and 2004 censuses and with estimates of the subsequent trends in fertility, mortality and international migration. Official population estimates for 1998, 2000 and 2005 from lNS Tunisia (Institut National de la Statistique) were also taken into account.
Total fertility: Based on official estimates of total fertility through 2005.
Infant and child mortality: Based on official estimates of infant mortality rates available through 2005.
Life expectancy at birth: Based on official estimates of life expectancy for 1995 to 2005, as reported by INS Tunisia. The age pattern of mortality conforms to the East model of the Coale-Demeny Model Life Tables.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1994-2004 intercensal period.

TURKEY

Total population (2005): Estimated to be consistent with the 2000 census and with estimates of the subsequent trends in fertility, mortality and international migration. Estimates for the years 2001 and 2005 from the Council of Europe were also considered.
Total fertility: Based on maternity-history data from the 1993, 1998 and 2003 Turkey DHS and on official estimates of total fertility from the Turkish Institute of Statistics through 2005.
Infant and child mortality: Based on: (a) maternity-history data from the 1993, 1998 and 2003 Turkey DHS and (b) official estimates from the Turkish Institute of Statistics and UNICEF through 2005.
Life expectancy at birth: Based on official estimates for 1995-2005 from the Turkish Institute of Statistics. The age pattern of mortality conforms to the East model of the Coale-Demeny Model Life Tables.
International migration: Based on: (a) data on the migration of Turks to and from European countries and the overseas countries of immigration and (b) refugees statistics compiled by UNHCR. Estimates from the Council of Europe were also considered.

TURKMENISTAN

Total population (2005): Estimated to be consistent with the 1989 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 2000 Turkmenistan DHS.
Infant and child mortality: Based on maternity-history data from the 2000 Turkmenistan DHS.
Life expectancy at birth: Based on official estimates of life expectancy available through 1998, adjusted for underregistration of deaths.
International migration: Based on official estimates of net international migration available through 1995.

TURKS AND CAICOS ISLANDS

Total population (2005): Estimated to be consistent with the 2001 census, with official population estimates for 2005 and with estimates of the subsequent trends in fertility, mortality and international migration.

TUVALU

Total population (2005): Estimated to be consistent with the 2002 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2003 classified by age of mother.
Infant and child mortality: Based on births and infant deaths registered through 2003.
Life expectancy at birth: Based on a life table for 1997-2002 derived from the average number of registered deaths by age and sex of the years 1997-2002 and the estimated mid-period population by age and sex.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1991-2002 intercensal period.

UGANDA

Total population (2005): Estimated to be consistent with the 2002 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) maternity-history data from the 1995, 2000-2001 and 2006 Uganda DHS and (b) estimates of total fertility from the 1959, 1969 and 1991 censuses.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 1988-1989, 1995 and 2000-2001 Uganda DHS. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR, on assumed levels of emigration and on the estimated

number of Ugandans who were expelled from the country in the early 1970s.

UKRAINE

Total population (2005): Estimated to be consistent with the 2001 census, with official population estimates for 1 January 2005 and 1 January 2006 and with estimates of trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2005.
Infant and child mortality: Based on births and infant deaths registered through 2005 and estimates from UNICEF that reflect an adjustment for underregistration of infant deaths. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on life tables through 2005 available from the Human Mortality Database, adjusted for underregistration of infant deaths. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on estimates of net international migration derived as the difference between overall population change and natural increase through 2005.

UNITED ARAB EMIRATES

Total population (2005): Estimated to be consistent with the preliminary results of the 2005 census, adjusted to take into account the non-nationals that were not counted in the census and with estimates of the trends in fertility, mortality and international migration. Official population estimates for the year 2000 from the Ministry of Economy of the United Arab Emirates were also considered.
Total fertility: Based on official estimates of total fertility derived from births by age of mother registered available through 2004.
Infant and child mortality: The more recent infant and child mortality estimates are derived from official life expectancy estimates by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables. Official infant and child mortality estimates have also been considered as well as estimates derived from data on children ever born and surviving classified by age of mother from the 1987-1988 Child Health Survey and from past censuses.
Life expectancy at birth: Based on official estimates of life expectancy available through 2003. In light of the preliminary population estimates from the 2005 Census, it could be that the 2000-2005 life expectancy estimates are slightly overestimated. Past estimates are derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1995-2005 intercensal period.

UNITED KINGDOM

Total population (2005): Estimated to be consistent with the 2001 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2005.
Infant and child mortality: Based on births and infant deaths registered through 2004.
Life expectancy at birth: Based on official life tables available through 2004.
International migration: Based on estimates of net international migration derived from border statistics available through 2005.

UNITED REPUBLIC OF TANZANIA

Total population (2005): Estimated to be consistent with the 2002 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1991-1992, 1996 and 2004 United Republic of Tanzania DHS and the 1999 Reproductive and Child Health Survey (RCHS).
Infant and child mortality: Based on maternity-history data and on data on children ever born and surviving classified by age of mother from

the 1991-1992, 1996 and 2004 United Republic of Tanzania DHS and the 1999 RCHS. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR.

UNITED STATES OF AMERICA[13]

Total population (2005): Estimated to be consistent with the 2000 census, which includes the population in the territory of the United States and United States citizens serving in the overseas armed forces, with an official population estimate for 1 July 2005 and with estimates of trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2005.
Infant and child mortality: Based on official estimates of infant mortality available through 2004. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Based on official estimates of life expectancy available through 2004. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1980-1990 and 1990-2000 intercensal periods.

UNITED STATES VIRGIN ISLANDS

Total population (2005): Estimated to be consistent with the 2000 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered by age of mother through 2000 and estimates of total fertility through 2005.
Infant and child mortality: Based on births and infant deaths registered through 2000 and infant mortality estimates through 2005.
Life expectancy at birth: Based on the total number of deaths registered through 2000, life expectancy estimates through 2005 and the assumption that the age pattern of mortality conforms to the Far Eastern model of the Coale-Demeny Model Life Tables.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1990-2000 intercensal period and net migration estimates produced by the US Census Bureau.

URUGUAY

Total population (2005): Estimated to be consistent with the 1996 and 2004 censuses, adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2004 classified by age of mother.
Infant and child mortality: Based on births and infant deaths registered through 2005.
Life expectancy at birth: Based on a life table derived from registered deaths by age and sex for 1999-2005 and the 1996 and 2004 census populations by age and sex.
International migration: Based on: (a) the number and characteristics of persons born in Uruguay and enumerated by the censuses of receiving countries in the Americas through 2000 and (b) estimates of net international migration derived as the difference between overall population growth and natural increase during the 1985-1996 intercensal period.

UZBEKISTAN

Total population (2005): Estimated to be consistent with the 1989 census, with official population estimates for 1 July 2001 and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official estimates of total fertility available through 2004 and on maternity-history data from the 1997 Uzbekistan

DHS and the 2002 Uzbekistan Health Examination Survey.
Infant and child mortality: Based on maternity-history data from the 2002 Uzbekistan Health Examination Survey.
Life expectancy at birth: Based on official estimates of life expectancy available through 2004, adjusted for underregistration of deaths.
International migration: Based on estimates of net international migration derived as the difference between overall population change and natural increase through 2001.

VANUATU

Total population (2005): Estimated to be consistent with the 1999 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 1989 and 1999 censuses.
Infant and child mortality: Based on data on children ever born and surviving classified by age of mother from the 1999 census.
Life expectancy at birth: Based on: (a) the estimated level of infant and child mortality; (b) tabulations of parental survivorship (orphanhood) by age of respondent from the 1999 census; and (c) by assuming that the age pattern of mortality conforms to the Far Eastern model of the United Nations Model Life Tables.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1989-1999 intercensal period.

VENEZUELA (BOLIVARIAN REPUBLIC OF)

Total population (2005): Estimated to be consistent with the 2001 census adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on births registered through 2001, classified by age of mother, estimates from the 1998 Encuesta de Población y Familia (ENPOFAM) and the 2001 census.
Infant and child mortality: Based on: (a) births and infant deaths registered through 2002, adjusted for underregistration; (b) data on children ever born and surviving classified by age of mother from the 2001 census; and (c) estimates from the 1998 Encuesta de Población y Familia (ENPOFAM).
Life expectancy at birth: Based on a life table derived from registered deaths by age and sex for 2000-2002 adjusted for underregistration by using the growth-balance method and from the 2000 census population by age and sex.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during each intercensal period and on foreign-born statistics for the 1990 and 2000 census rounds.

VIET NAM

Total population (2005): Estimated to be consistent with the 1999 census and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1997 and 2002 Viet Nam DHS.
Infant and child mortality: Based on maternity-history data from the 1997 and 2002 Viet Nam DHS and information from the 1999 census. Child mortality estimates from UNICEF were also considered.
Life expectancy at birth: Based on a life table for 1988-1989 derived from data on deaths during the 12 months preceding the enumeration, the population enumerated by the 1989 census, both classified by age and sex and information from a 1998-1999 life table from the 1999 census and official population projections.
International migration: Based on (a) refugees resettled in the major countries of immigration; (b) refugee statistics compiled by UNHCR; and (c) the number of immigrants from Viet Nam to developed countries.

WALLIS AND FUTUNA ISLANDS

Total population (2005): Estimated to be consistent with the 1996 and 2003 censuses and with estimates of the subsequent trends in fertility, mortality and international migration.

WESTERN SAHARA

Total population (2005): Estimated to be consistent with the coverage of the territory of Western Sahara by the 1994 and 2004 censuses of Morocco and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on official age-specific fertility estimates for several sub-regions of Western Sahara, as reported in the 2004 Census of Morocco.
Infant and child mortality: In the absence of statistics indicative of mortality in childhood, infant mortality was assumed to have levels and follow trends similar to those estimated for neighbouring countries with similar socio-economic conditions as those of Western Sahara.
Life expectancy at birth: In the absence of statistics indicative of mortality levels and trends, life expectancy was assumed to have levels and follow trends similar to those estimated for neighbouring countries with similar socio-economic conditions as those of Western Sahara.
International migration: Based on estimates of net international migration derived as the difference between overall population growth and natural increase during the 1994-2004 intercensal period. Data on refugee flows compiled by UNHCR were also taken into account.

YEMEN

Total population (2005): Estimated to be consistent with the 1994 and 2004 censuses and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on maternity-history data from the 1979 Yemen WFS, the 1991-1992 and 1997 Yemen DHS and the 2003 Yemen Family Health Survey (YFHS/PAPFAM).
Infant and child mortality: Based on maternity-history data from the 1997 Yemen DHS and the 2003 Yemen Family Health Survey (YFHS/PAPFAM). Estimates from UNICEF were also considered.
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the West model of the Coale-Demeny Model Life Tables. Official estimates derived from the 1994 census and estimates from WHO were also taken into account.
International migration: Based on estimates of the number of Yemeni migrants who returned to Yemen during the aftermath of the Gulf War and refugee statistics compiled by UNHCR.

ZAMBIA

Total population (2005): Estimated to be consistent with the 1990 and 2000 censuses, adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) official estimates from the 1969, 1980, 1990 and 2000 censuses and (b) maternity-history data from the 1992, 1996 and 2001-2002 Zambia DHS.
Infant and child mortality: Based on: (a) data on children ever born and surviving classified by age of mother from the 1969, 1974, 1980, 1990 and 2000 censuses; (b) maternity- history data from the 1992, 1996 and 2001-2002 Zambia DHS; and (c) estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).
International migration: Based on refugee statistics compiled by UNHCR and on data on Zambians migrating to selected developed countries.

ZIMBABWE

Total population (2005): Estimated to be consistent with the 1992 and 2002 censuses, adjusted for underenumeration and with estimates of the subsequent trends in fertility, mortality and international migration.
Total fertility: Based on: (a) data on children ever born and births in the preceding 12 months, both classified by age of mother, from the 2002

census and (b) maternity-history data from the 1988, 1994 and 1999 Zimbabwe DHS.

Infant and child mortality: Based on: (a) data on children ever born and surviving classified by age of mother from the 1969, 1992 and 2002 censuses; (b) maternity-history data from the 1988, 1994 and 1999 Zimbabwe DHS and (c) estimates from UNICEF. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).

Life expectancy at birth: Derived from estimates of infant and child mortality by assuming that the age pattern of mortality conforms to the North model of the Coale-Demeny Model Life Tables. The demographic impact of AIDS has been factored into the mortality estimates (see chapter IV).

International migration: Based on refugee statistics compiled by UNHCR and data on Zimbabweans migrating to selected developed countries.

[1] The programme is currently named Measure DHS and information is accessible through their website at www.measuredhs.com

[2] For more information. see PAPFAM's web site at: www.papfam.org

[3] For more information. see UNICEF's web site at: www.childinfo.org

[4] Including Christmas Island, Cocos (Keeling) Islands and Norfolk Island.

[5] Refers to Guernsey and Jersey.

[6] Including Mayotte.

[7] Including Åland Islands.

[8] Also referred to as United Kingdom.

[9] Including Agalega, Rodrigues and Saint Brandon.

[10] Including Svalbard and Jan Mayen Islands.

[11] Including Ascension and Tristan da Cunha.

[12] Also referred to as TFYR Macedonia.

[13] Also referred to as United States.

VIII. ORDERING THE WORLD POPULATION PROSPECTS DATA ON CD-ROM

The *2006 Revision* of the *World Population Prospects,* prepared by the United Nations Population Division, provides a comprehensive and consistent set of population data for the world's countries and their aggregates.

The results of this Revision are available on two CD-ROM editions that differ with regard to the data included and their prices (table 1). All two CDs contain estimates and projections of national populations by five-year age group and sex for 1950-2050 and demographic indicators for the same period. Data for 1950-2005 are estimates and those thereafter are projections.

The Comprehensive CD-ROM contains all essential data such as total births, total deaths, total net-migration, the respective crude rates, life expectancy at birth by sex, infant and child mortality, total fertility, net-reproduction rate and population growth rates for 1950-2050 by five-year periods for all fertility projection variants (low, medium, high and constant-fertility). It includes population by five-year age group and sex for five-year periods and interpolated annual total population. In addition, this CD edition provides births and deaths by five-year age group, the corresponding age-specific fertility and mortality rates and abridged life tables (survivors and life expectancies at specific ages). It also comprises standard sets of demographic indicators and population by age group and sex for four other variants (instant-replacement-fertility, zero-migration, constant-mortality and no mortality and fertility change) and for three AIDS scenarios. All data on this CD are presented in Excel worksheets and correspond to the datasets 1 to 3 and 5 to 14 listed in table 1.

The Extended CD-ROM contains all the data from the Comprehensive CD, plus population figures by single calendar year and single age group for 1950-2050. This CD also provides interpolated demographic indicators for single calendar years (total births and deaths, their respective crude rates, life expectancy at birth by sex, infant and child mortality, survivors to age 1, total fertility), urban population, population density and interpolated total population by main age group and sex, and their respective percentage distributions and sex ratios. The data are presented in Excel and database formats (ASCII comma delimited format for all datasets) and correspond to all datasets listed in table 1.

Both CDs show data for 229 countries and areas, 33 country aggregates, including the world as a whole, the more and the less developed regions, and the major areas. For the AIDS scenarios (datasets 11-14), special aggregations by region and HIV prevalence level in 2005 are provided for 62 countries affected by the HIV/AIDS epidemic. The Microsoft Excel files correspond to version 97/2003 and later of this software. For a detailed listing of the contents of each CD, see table 2. Data files in database formats are shown in table 3. All CDs include the English Executive Summary of *World Population Prospects: The 2006 Revision* in Adobe Acrobat PDF format.

For information on how to order this CD-ROM please see the order form at the end.

Table 1. Summary contents of each CD-ROM

Description: **Datasets included on CD-ROM**	**Comprehensive CD**	**Extended CD**
0. Locations list	Excel format	Excel and database formats
1. Period indicators, five-year periods	Excel format	Excel and database formats
2. Stock indicators, five-year periods (and annual population)	Excel format	Excel and database formats
3. Population by five-year age group and sex, five-year periods	Excel format	Excel and database formats
4. Population by five-year age group and sex, annual		Excel and database formats
5. Mortality indicators by age and sex, five-year periods	Excel format	Excel and database formats
6. Fertility indicators by age, five-year periods	Excel format	Excel and database formats
7. Instant-replacement-fertility variant	Excel format	Excel and database formats
8. Zero-migration variant	Excel format	Excel and database formats
9. Constant-mortality variant	Excel format	Excel and database formats
10. No-change variant (constant-mortality and constant-fertility)	Excel format	Excel and database formats
11. No-AIDS mortality scenario	Excel format	Excel and database formats
12. AIDS mortality scenario (medium/default)	Excel format	Excel and database formats
13. High-AIDS mortality scenario	Excel format	Excel and database formats
14. AIDS-Vaccine mortality scenario	Excel format	Excel and database formats
15. Interpolated demographic and population indicators, annual		Excel and database formats
16. Population (by sex and both sexes combined) interpolated by single years of age and single calendar years		Excel and database formats
Price (US$)	$250	$800

TABLE 2. CONTENTS OF DATASETS IN DIGITAL FORM

Dataset and File	Indicators	CD-ROM Edition[1]	Number of countries or areas	Projection variants or scenarios (starting in 2005)	Periods covered	Age groups
F0	Location list with codes (numerical and ISO3), description, major area, region and development group; countries with explicit HIV/AIDS mortality modelling in WPP 2006 revision, HIV prevalence rate (%) in population aged 15-49 years in 2005 (UNAIDS, 2006) and by prevalence groups.	C/E	229	---	---	---
Dataset 1.	**Period indicators, five-year periods**					
F1.	Total fertility	C/E	195	Low, medium, high, constant-fertility	1950-1955,….2045-2050	---
F2.	Net reproduction rate	C/E	195	Low, medium, high, constant-fertility	1950-1955,….2045-2050	---
F3.	Crude birth rate	C/E	195	Low, medium, high, constant-fertility	1950-1955,….2045-2050	---
F4.	Births	C/E	195	Low, medium, high, constant-fertility	1950-1955,….2045-2050	---
F5.	Life expectancy at birth by sex	C/E	195	Medium	1950-1955,….2045-2050	---
F6.	Infant mortality, q(1)	C/E	195	Medium	1950-1955,….2045-2050	---
	Under-five mortality, q(5)	C/E	195	Medium	1995-2000,….2045-2050	---
F7.	Crude death rate	C/E	195	Low, medium, high, constant-fertility	1950-1955,….2045-2050	---
F8.	Total number of deaths (both sexes)	C/E	195	Low, medium, high, constant-fertility	1950-1955,….2045-2050	---
F8.	Total number of male deaths	C/E	195	Low, medium, high, constant-fertility	1950-1955,….2045-2050	---
F8.	Total number of female deaths	C/E	195	Low, medium, high, constant-fertility	1950-1955,….2045-2050	---
F9.	Net migration rate	C/E	195	Low, medium, high, constant-fertility	1950-1955,….2045-2050	---
F10.	Net number of migrants (both sexes)	C/E	195	Medium	1950-1955,….2045-2050	---
F11.	Average annual rate of population change	C/E	229	Low, medium, high, constant-fertility	1950-1955,….2045-2050	---
F12.	Rate of natural increase	C/E	195	Low, medium, high, constant-fertility	1950-1955,….2045-2050	---
F13.	Sex ratio at birth	C/E	195	Medium	1950-1955,….2045-2050	---
Dataset 2.	**Stock indicators**					
F1.	Total population (both sexes), annual	C/E	229	Low, medium, high, constant-fertility	1950, 1951,….2049, 2050	---
F2.	Male population, annual	C/E	195	Low, medium, high, constant-fertility	1950, 1951,….2049, 2050	---
F3.	Female population, annual	C/E	195	Low, medium, high, constant-fertility	1950, 1951,….2049, 2050	---
F4.	Sex ratio of the population	C/E	195	Low, medium, high, constant-fertility	1950, 1955,….2045, 2050	---
F5.	Dependency ratio (0-14 and 65+ by 15-64)	C/E	195	Low, medium, high, constant-fertility	1950, 1955,….2045, 2050	---
F6.	Median age of the population	C/E	195	Low, medium, high, constant-fertility	1950, 1955,….2045, 2050	---
F7.	Total population by main age group	C/E	195	Low, medium, high, constant-fertility	1950, 1955,….2045, 2050	0-4, 5-14, 0-14, 15-24, 15-59, 15-64, 60+, 65+, 80+, 90+
F8.	Percentage total population by main age group	C/E	195	Low, medium, high, constant-fertility	1950, 1955,….2045, 2050	0-4, 5-14, 0-14, 15-24, 15-59, 15-64, 60+, 65+, 80+, 90+
F9.	Sex ratio and feminity ratio by main age group	C/E	195	Low, medium, high, constant-fertility	1950, 1955,….2045, 2050	0-4, 5-14, 0-14, 15-24, 15-59, 15-64, 60+, 65+, 80+, 90+

TABLE 2. CONTENTS OF DATASETS IN DIGITAL FORM

Dataset and File	Indicators	CD-ROM Edition[1]	Number of countries or areas	Projection variants or scenarios (starting in 2005)	Periods covered	Age groups
F10.	Population density	C/E	229	Low, medium, high, constant-fertility	1950, 1955,….2045, 2050	---
Dataset 3.	**Population by age and sex, five-year periods**					
F1.	Population by five-year age group (both sexes)	C/E	195	Low, medium, high, constant-fertility	1950, 1955,….1985, 1990	0-4, 5-9,…75-79, 80+
					1995, 2000,….2045, 2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+
F2.	Male population by five-year age group	C/E	195	Low, medium, high, constant-fertility	1950, 1955,….1985, 1990	0-4, 5-9,…75-79, 80+
					1995, 2000,….2045, 2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+
F3.	Female population by five-year age group	C/E	195	Low, medium, high, constant-fertility	1950, 1955,….1985, 1990	0-4, 5-9,…75-79, 80+
					1995, 2000,….2045, 2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+
Dataset 4.	**Population by age and sex, annual**					
F1A.	Population by five-year age group (both sexes)	E	195	Medium	1950, 1951,….1994	0-4, 5-9,…75-79, 80+
F1B.	"	"	"	"	1995, 1996,….2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+
F2A.	Population by five-year age group (male)	E	195	Medium	1950, 1951,….1994	0-4, 5-9,…75-79, 80+
F2B.	"	"	"	"	1995, 1996,….2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+
F3A.	Population by five-year age group (female)	E	195	Medium	1950, 1951,….1994	0-4, 5-9,…75-79, 80+
F3B.	"	"	"	"	1995, 1996,….2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+
Dataset 5.	**Mortality indicators by age and sex, five-year periods**					
F1.	Deaths by five-year age group (both sexes)	C/E	195	Low, medium, high, constant-fertility	1995-2000,….2045-2050	0-4, 5-9,….75-79, 80+
F2.	Deaths by five-year age group (male)	C/E	195	Low, medium, high, constant-fertility	1995-2000,….2045-2050	0-4, 5-9,….75-79, 80+
F3.	Deaths by five-year age group (female)	C/E	195	Low, medium, high, constant-fertility	1995-2000,….2045-2050	0-4, 5-9,….75-79, 80+
F4.	Life table l(x) values by sex	C/E	195	Medium	1995-2000,….2045-2050	0, 1, 5, 10,….80, 85
F5.	Life expectancy at age (x) by sex	C/E	195	Medium	1995-2000,….2045-2050	0, 1, 5, 10,….95, 100
Dataset 6.	**Fertility indicators by age, five-year periods**					
F1.	Births by five-year age group of mother	C/E	195	Low, medium, high, constant-fertility	1995-2000,….2045-2050	15-19, 20-24,…45-49
F2.	Age-specific fertility rates	C/E	195	Low, medium, high, constant-fertility	1995-2000,….2045-2050	15-19, 20-24,…45-49
Dataset 7.	**Instant-replacement-fertility variant**					
F1.	Population by five-year age group and sex	C/E	195	Instant-replacement-fertility	2010, 2015,… 2045, 2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+
F2.	Total population (both sexes)	C/E	229	Instant-replacement-fertility	2006, 2007,….2049, 2050	---
F3.	Dependency ratio (0-14 and 65+ by 15-64)	C/E	195	Instant-replacement-fertility	2010, 2015,… 2045, 2050	---
F4.	Median age of the population	C/E	195	Instant-replacement-fertility	2010, 2015,… 2045, 2050	---

TABLE 2. CONTENTS OF DATASETS IN DIGITAL FORM

Dataset and File	Indicators	CD-ROM Edition[1]	Number of countries or areas	Projection variants or scenarios (starting in 2005)	Periods covered	Age groups
F5.	Crude birth rate	C/E	195	Instant-replacement-fertility	2005-2010,….2045-2050	---
F6.	Crude death rate	C/E	195	Instant-replacement-fertility	2005-2010,….2045-2050	---
F7.	Average annual rate of population change	C/E	195	Instant-replacement-fertility	2005-2010,….2045-2050	---
F8.	Total fertility	C/E	195	Instant-replacement-fertility	2005-2010,….2045-2050	---
Dataset 8.	**Zero-migration variant**					
F1.	Population by five-year age group and sex	C/E	195	Zero-migration	2010, 2015,… 2045, 2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+
F2.	Total population (both sexes)	C/E	229	Zero-migration	2006, 2007,….2049, 2050	---
F3.	Dependency ratio (0-14 and 65+ by 15-64)	C/E	195	Zero-migration	2010, 2015,… 2045, 2050	---
F4.	Median age of the population	C/E	195	Zero-migration	2010, 2015,… 2045, 2050	---
F5.	Crude birth rate	C/E	195	Zero-migration	2005-2010,….2045-2050	---
F6.	Crude death rate	C/E	195	Zero-migration	2005-2010,….2045-2050	---
F7.	Average annual rate of population change	C/E	195	Zero-migration	2005-2010,….2045-2050	---
Dataset 9.	**Constant-mortality variant**					
F1.	Population by five-year age group and sex	C/E	195	Constant-mortality	2010, 2015,… 2045, 2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+
F2.	Total population (both sexes)	C/E	229	Constant-mortality	2006, 2007,….2049, 2050	---
F3.	Dependency ratio (0-14 and 65+ by 15-64)	C/E	195	Constant-mortality	2010, 2015,… 2045, 2050	---
F4.	Median age of the population	C/E	195	Constant-mortality	2010, 2015,… 2045, 2050	---
F5.	Crude birth rate	C/E	195	Constant-mortality	2005-2010,….2045-2050	---
F6.	Crude death rate	C/E	195	Constant-mortality	2005-2010,….2045-2050	---
F7.	Average annual rate of population change	C/E	195	Constant-mortality	2005-2010,….2045-2050	---
F8.	Deaths by five-year age group and sex	C/E	195	Constant-mortality	2005-2010,….2045-2050	0-4, 5-9, ...75-79, 80+
F9.	Life expectancy at birth by sex	C/E	195	Constant-mortality	2005-2010,….2045-2050	---
Dataset 10.	**No-change variant (constant-mortality and constant-fertility)**					
F1.	Population by five-year age group and sex	C/E	195	Constant mortality and fertility	2010, 2015,… 2045, 2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+
F2.	Total population (both sexes)	C/E	229	Constant mortality and fertility	2006, 2007,….2049, 2050	---
F3.	Dependency ratio (0-14 and 65+ by 15-64)	C/E	195	Constant mortality and fertility	2010, 2015,… 2045, 2050	---
F4.	Median age of the population	C/E	195	Constant mortality and fertility	2010, 2015,… 2045, 2050	---
F5.	Crude birth rate	C/E	195	Constant mortality and fertility	2005-2010,….2045-2050	---
F6.	Crude death rate	C/E	195	Constant mortality and fertility	2005-2010,….2045-2050	---
F7.	Average annual rate of population change	C/E	195	Constant mortality and fertility	2005-2010,….2045-2050	---
F8.	Deaths by five-year age group and sex	C/E	195	Constant mortality and fertility	2005-2010,….2045-2050	0-4, 5-9, ...75-79, 80+
F9.	Life expectancy at birth by sex	C/E	195	Constant mortality and fertility	2005-2010,….2045-2050	---

TABLE 2. CONTENTS OF DATASETS IN DIGITAL FORM

Dataset and File	Indicators	CD-ROM Edition[1]	Number of countries or areas	Projection variants or scenarios (starting in 2005)	Periods covered	Age groups
AIDS Mortality Scenarios for 62 countries affected by the HIV/AIDS epidemic and 13 special aggregations (by region and HIV prevalence level in 2005)						
Dataset 11.	**No-AIDS mortality scenario**					
11.1	**Period indicators**					
F2.	Net reproduction rate	C/E	62	No-AIDS	1980-1985,….2045-2050	---
F3.	Crude birth rate	C/E	62	No-AIDS	1980-1985,….2045-2050	---
F4.	Births	C/E	62	No-AIDS	1980-1985,….2045-2050	---
F5.	Life expectancy at birth by sex	C/E	62	No-AIDS	1980-1985,….2045-2050	---
F6.1	Infant mortality, q(1)	C/E	62	No-AIDS	1980-1985,….2045-2050	---
F6.2	Under-five mortality, q(5)	C/E	62	No-AIDS	1995-2000,….2045-2050	---
F7.	Crude death rate	C/E	62	No-AIDS	1980-1985,….2045-2050	---
F8.1	Total number of deaths (both sexes)	C/E	62	No-AIDS	1980-1985,….2045-2050	---
F8.2	Total number of male deaths	C/E	62	No-AIDS	1980-1985,….2045-2050	---
F8.3	Total number of female deaths	C/E	62	No-AIDS	1980-1985,….2045-2050	---
F11.	Average annual rate of population change	C/E	62	No-AIDS	1980-1985,….2045-2050	---
F12.	Rate of natural increase	C/E	62	No-AIDS	1980-1985,….2045-2050	---
11.2	**Stock indicators**					
F1.	Total population (both sexes), annual	C/E	62	No-AIDS	1980, 1981,….2049, 2050	---
F2.	Male population, annual	C/E	62	No-AIDS	1980, 1981,….2049, 2050	---
F3.	Female population, annual	C/E	62	No-AIDS	1980, 1981,….2049, 2050	---
F4.	Sex ratio of the population	C/E	62	No-AIDS	1980, 1985,….2045, 2050	---
F5.	Dependency ratio (0-14 and 65+ by 15-64)	C/E	62	No-AIDS	1980, 1985,….2045, 2050	---
F6.	Median age of the population	C/E	62	No-AIDS	1980, 1985,….2045, 2050	---
11.3	**Population by age and sex, five-year periods**					
F1.	Population by five-year age group (both sexes)	C/E	62	No-AIDS	1980, 1985,…. 2045, 2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+
F2.	Male population by five-year age group	C/E	62	No-AIDS	1980, 1985,…. 2045, 2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+
F3.	Female population by five-year age group	C/E	62	No-AIDS	1980, 1985,…. 2045, 2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+
11.4	**Population by age and sex, annual**					
F1.	Population by five-year age group	C/E	62	No-AIDS	1980, 1981,….2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+
F2.	Population by five-year age group (male)	C/E	62	No-AIDS	1980, 1981,….2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+
F3.	Population by five-year age group (female)	C/E	62	No-AIDS	1980, 1981,….2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+

TABLE 2. CONTENTS OF DATASETS IN DIGITAL FORM

Dataset and File	Indicators	CD-ROM Edition[1]	Number of countries or areas	Projection variants or scenarios (starting in 2005)	Periods covered	Age groups
11.5	**Mortality indicators by age and sex, five-year periods**					
F1.	Deaths by five-year age group (both sexes)	C/E	62	No-AIDS	1980-1985,….2045-2050	0-4, 5-9,….75-79, 80+
F2.	Deaths by five-year age group (male)	C/E	62	No-AIDS	1980-1985,….2045-2050	0-4, 5-9,….75-79, 80+
F3.	Deaths by five-year age group (female)	C/E	62	No-AIDS	1980-1985,….2045-2050	0-4, 5-9,….75-79, 80+
F4.	Life table l(x) values by sex	C/E	62	No-AIDS	1995-2000,….2045-2050	0, 1, 5, 10,….80, 85
F5.	Life expectancy at age (x) by sex	C/E	62	No-AIDS	1995-2000,….2045-2050	0, 1, 5, 10,….95, 100
11.6	**Fertility indicators by age, five-year periods**					
F1.	Births by five-year age group of mother	C/E	62	No-AIDS	1995-2000,….2045-2050	15-19, 20-24,…45-49
F2.	Age-specific fertility rates	C/E	62	No-AIDS	1995-2000,….2045-2050	15-19, 20-24,…45-49
Dataset 12.	**AIDS mortality scenario (medium/default)**					
F1.	Population by five-year age group and sex	C/E	62	AIDS (medium)	1980, 1985,….2045, 2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+
F2.	Total population (both sexes)	C/E	62	AIDS (medium)	1980, 1981,….2049, 2050	---
F3.	Dependency ratio (0-14 and 65+ by 15-64)	C/E	62	AIDS (medium)	1980, 1985,….2045, 2050	---
F4.	Median age of the population	C/E	62	AIDS (medium)	1980, 1985,….2045, 2050	---
F5.	Crude birth rate	C/E	62	AIDS (medium)	1980-1985,….2045-2050	---
F6.	Crude death rate	C/E	62	AIDS (medium)	1980-1985,….2045-2050	---
F7.	Average annual rate of population change	C/E	62	AIDS (medium)	1980-1985,….2045-2050	---
F8.	Deaths by five-year age group and sex	C/E	62	AIDS (medium)	1980-1985,….2045-2050	0-4, 5-9,….75-79, 80+
F9.	Life expectancy at birth by sex	C/E	62	AIDS (medium)	1980-1985,….2045-2050	---
F10.	Life table l(x) values by sex	C/E	62	AIDS (medium)	1995-2000,….2045-2050	0, 1, 5, 10,….80, 85
F11.	Life expectancy at age (x) by sex	C/E	62	AIDS (medium)	1995-2000,….2045-2050	0, 1, 5, 10,….95, 100
Dataset 13.	**High-AIDS mortality scenario (2005 situation constant until 2050)**					
F1.	Population by five-year age group and sex	C/E	62	High-AIDS	2010, 2015,….2045, 2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+
F2.	Total population (both sexes)	C/E	62	High-AIDS	2006, 2007,….2049, 2050	---
F3.	Dependency ratio (0-14 and 65+ by 15-64)	C/E	62	High-AIDS	2010, 2015,….2045, 2050	---
F4.	Median age of the population	C/E	62	High-AIDS	2010, 2015,….2045, 2050	---
F5.	Crude birth rate	C/E	62	High-AIDS	2005-2010,….2045-2050	---
F7.	Average annual rate of population change	C/E	62	High-AIDS	2005-2010,….2045-2050	---
F8.	Deaths by five-year age group and sex	C/E	62	High-AIDS	2005-2010,….2045-2050	0-4, 5-9,….75-79, 80+
F9.	Life expectancy at birth by sex	C/E	62	High-AIDS	2005-2010,….2045-2050	---
Dataset 14.	**AIDS-Vaccine scenario (no new HIV infection starting in 2010)**					
F1.	Population by five-year age group and sex	C/E	62	AIDS-Vaccine	2010, 2015,….2045, 2050	0-4, 5-9, …75-79, 80+, 80-84, …95-99, 100+
F2.	Total population (both sexes)	C/E	62	AIDS-Vaccine	2006, 2007,….2049, 2050	---

TABLE 2. CONTENTS OF DATASETS IN DIGITAL FORM

Dataset and File	Indicators	CD-ROM Edition[1]	Number of countries or areas	Projection variants or scenarios (starting in 2005)	Periods covered	Age groups
F3.	Dependency ratio (0-14 and 65+ by 15-64)	C/E	62	AIDS-Vaccine	2010, 2015,….2045, 2050	---
F4.	Median age of the population	C/E	62	AIDS-Vaccine	2010, 2015,….2045, 2050	---
F5.	Crude birth rate	C/E	62	AIDS-Vaccine	2005-2010,….2045-2050	---
F6.	Crude death rate	C/E	62	AIDS-Vaccine	2005-2010,….2045-2050	---
F7.	Average annual rate of population change	C/E	62	AIDS-Vaccine	2005-2010,….2045-2050	---
F8.	Deaths by five-year age group and sex	C/E	62	AIDS-Vaccine	2005-2010,….2045-2050	0-4, 5-9,….75-79, 80+
F9.	Life expectancy at birth by sex	C/E	62	AIDS-Vaccine	2005-2010,….2045-2050	---
Dataset 15. Interpolated annual Indicators (SUPPLEMENT)						
F1.	Total number of deaths (both sexes)	E	195	Medium	1950, 1951,….2029, 2030	---
F1.	Crude death rate	E	195	Medium	1950, 1951,….2029, 2030	---
F1.	Life expectancy at birth by sex	E	195	Medium	1950, 1951,….2029, 2030	---
F1.	Infant deaths (under age 1)	E	195	Medium	1950, 1951,….2029, 2030	---
F1.	Infant mortality, q(1)	E	195	Medium	1950, 1951,….2029, 2030	---
F1.	Survivors to age 1	E	195	Medium	1950, 1951,….2029, 2030	---
F1.	Under-five mortality, q(5)	E	195	Medium	1950, 1951,….2029, 2030	---
F1.	Births	E	195	Medium	1950, 1951,….2029, 2030	---
F1.	Crude birth rate	E	195	Medium	1950, 1951,….2029, 2030	---
F1.	Total fertility	E	195	Medium	1950, 1951,….2029, 2030	---
F1.	Rate of natural increase	E	195	Medium	1950, 1951,….2029, 2030	---
F2.	Interpolated population by main age group	E	195	Medium	1950, 1951,… 2029, 2030	< 1, < 5, < 15, < 18, 5-14, 6-11, 12-14, 15-17, 15-24, 18-23, 15-59, 15-64, 60+, 65+, 80+, 90+
F2.	Interpolated female population in reproductive ages	E	195	Medium	1950, 1951,… 2029, 2030	15-49
F2.	Interpolated total population	E	195	Medium	1950, 1951,… 2029, 2030	---
F2.	Interpolated urban population	E	195	Medium	1950, 1951,… 2029, 2030	---
F3.	Percentage of total population by main age group	E	195	Medium	1950, 1951,… 2029, 2030	< 1, < 5, < 15, < 18, 5-14, 6-11, 12-14, 15-17, 15-24, 18-23, 15-59, 15-64, 60+, 65+, 80+, 90+
F3.	Percentage of female population in reproductive ages in total population	E	195	Medium	1950, 1951,… 2029, 2030	15-49
F3.	Interpolated percentage urban population	E	195	Medium	1950, 1951,… 2029, 2030	---
F3.	Interpolated population density	E	195	Medium	1950, 1951,… 2029, 2030	---
Dataset 16. Interpolated annual populations by single age (INTERPOLATED)						
F1.	Population by single age (both sexes)	E	195	Medium	1950, 1951,….1994	0, 1, 2,… 79, 80+
					1995, 1996,….2050	0, 1, 2,… 79, 80+, 81… 99, 100+

TABLE 2. CONTENTS OF DATASETS IN DIGITAL FORM

Dataset and File	Indicators	CD-ROM Edition[1]	Number of countries or areas	Projection variants or scenarios (starting in 2005)	Periods covered	Age groups
F2.	Population by single age (male)	E	195	Medium	1950, 1951,….1994	0, 1, 2,… 79, 80+
					1995, 1996,….2050	0, 1, 2,… 79, 80+, 81… 99, 100+
F3.	Population by single age (female)	E	195	Medium	1950, 1951,….1994	0, 1, 2,… 79, 80+
					1995, 1996,….2050	0, 1, 2,… 79, 80+, 81… 99, 100+

Note: (1) CD-ROM editions are: C = Comprehensive, E = Extended

Datasets 11 to 14 present, in addition to the default AIDS mortality scenario (medium), three other AIDS scenarios for 62 countries affected by the HIV/AIDS epidemic: (1) the No-AIDS scenario applies the mortality likely to be exhibited by the non-infected population to the whole population, thus excluding the direct impacts of the epidemic; (2) the High-AIDS scenario assumes that the AIDS modelling parameters determining the path of the HIV/AIDS epidemic remain constant at their 2005 level; and (3) the AIDS-Vaccine scenario assumes that there are no new HIV infections starting in 2010. The estimates associated with the No-AIDS scenario (that is, the figures for 1980-2005) differ from the estimates of the other variants because AIDS started affecting the populations in the majority of the highly-affected countries around 1980. By comparing these results with those of the estimates and medium variant that include explicitly the effects of the HIV/AIDS epidemic, the user can infer the impact of the epidemic. The two other AIDS scenarios (High-AIDS mortality and AIDS-Vaccine mortality) provide alternative bounds on the possible course of the epidemic.

TABLE 3. DATA FILES IN DATABASE FORMAT INCLUDED IN THE EXTENDED CD-ROM EDITION

Topic / Data file	Description	Data file format[1]	Number of indicators[2]	Number of records
Locations.csv	Location list with codes (numerical and ISO3), description, major area, region and development group; countries with explicit HIV/AIDS mortality modelling in WPP 2006 revision, HIV prevalence rate (%) in population aged 15-49 years in 2005 (UNAIDS, 2006) and by prevalence groups.	CSV	12	277
DB01. Period indicators				
DB01_Period_Indicators.csv	All period indicators (total fertility, net reproduction rate, crude birth rate, births, life expectancy at birth, infant mortality, under-five mortality, crude death rate, number of deaths (by sex), net migration rate, net number of migrants, average annual rate of population change, rate of natural increase, sex ratio at birth) by major area, region and country, for estimates and all 11 projection variants or scenarios, 1950-2050. Data only for 1980-2050 for AIDS scenarios.	CSV	18	48,170
DB02. Stock indicators				
DB02_Populations_Annual.csv	Total population (by sex and both sexes combined) and average annual rate of population change, by major area, region and country, for estimates and all 11 projection variants or scenarios, annually for 1950-2050. Data only for 1980-2050 for AIDS scenarios.	CSV	4	243,374
DB02_Populations_Main_Age_Groups.csv	Total population by main age group (by sex and both sexes combined) by major area, region and country, for estimates and all 11 projection variants or scenarios, 1950-2050. Data only for 1980-2050 for AIDS scenarios.	CSV	54	44,982
DB02_Stock_Indicators.csv	All stock indicators (total population by sex, dependency ratio, sex ratio, median age, population density, percentage by main age group, sex ratio (M/F) and feminity ratio (F/M) by main age group), by major area, region and country, for estimates and all 11 projection variants or scenarios, 1950-2050. Data only for 1980-2050 for AIDS scenarios.	CSV	92	50,694
DB03. Population by age and sex, five-year periods	Population by age group and sex, by major area, region and country, for estimates and all 11 projection variants or scenarios, 1950-2050. Data only for 1980-2050 for AIDS scenarios.			
DB03_Population_Quinquennial.csv	Database format with sex and age in rows.	CSV	1	2,695,978
DB03_Population_By_Sex_Quinquennial.csv	Database format with sex in column and age in row.	CSV	3	898,659
DB03_Population_By_Age_Quinquennial.csv	Database format with sex in row and age from 0 to 100+ in column.	CSV	22	134,946
DB04. Population by age and sex, annual	Population by age group and sex, by major area, region and country, annually for 1950-2050 (estimates and Medium variant, and 4 AIDS mortality scenarios). Data only for 1980-2050 for AIDS scenarios.			
DB04_Population_Annual.csv	Database format with sex and age in rows.	CSV	1	2,694,667
DB04_Population_By_Sex_Annual.csv	Database format with sex in column and age in row.	CSV	3	898,222
DB04_Population_By_Age_Annual.csv	Database format with sex in row and age from 0 to 100+ in column.	CSV	22	132,303

TABLE 3. DATA FILES IN DATABASE FORMAT INCLUDED IN THE EXTENDED CD-ROM EDITION

Topic / Data file	Description	Data file format[1]	Number of indicators[2]	Number of records
DB05. Mortality indicators by age and sex	Total deaths by age group and sex, by major area, region and country, for estimates and all 11 projection variants or scenarios,1995-2050. Data only for 1980-2050 for AIDS scenarios.			
DB05_Deaths.csv	Database format with sex and age in rows.	CSV	1	1,286,934
DB05_Deaths_By_Sex.csv	Database format with sex in column and age in row.	CSV	3	428,978
DB05_Deaths_By_Age.csv	Database format with sex in row and age from 0 to 100+ in column.	CSV	22	75,702
	Life Table (by sex and both sexes combined) by major area, region and country, 1995-2050 (estimates, medium variant and No-AIDS scenario).			
DB05_Life_Table.csv	Life table survivors, (l(x)), and life expectancy at exact age, e(x) (by sex and both sexes combined). Database format with sex and age in rows.	CSV	2	232,320
DB05_Life_Table_lx_By_Age.csv	Life table survivors, (l(x)), at exact age (x) (by sex and both sexes combined). Database format with sex in row and age from 0 to 85 in column.	CSV	18	10,560
DB05_Life_Table_ex_By_Age.csv	Life expectancy at exact age, e(x) (by sex and both sexes combined). Database format with sex in row and age from 0 to 100 in column.	CSV	21	10,560
DB06. Fertility indicators by age	Births by age group of mother and age-specific fertility rates, by major area, region and country, for estimates and all 11 projection variants or scenarios, 1995-2050. Data only for 1980-2050 for AIDS scenarios.			
DB06_Fertility_Indicators.csv	Database format with indicators in column and age groups in row.	CSV	2	176,638
DB06_Fertility_Indicators_By_Age.csv	Database format with indicators by age group in column.	CSV	14	25,234
DB15. Interpolated annual indicators				
WPP2006_SUP_F1_Annual_Demographic_Indicators.csv	Interpolated demographic indicators by major area, region and country, annually for 1950-2050 (estimates and medium variant).	CSV	16	222,832
WPP2006_SUP_F2_Annual_Population_Indicators.csv	Interpolated total population by main age group and urban population, by major area, region and country, annually for 1950-2050 (estimates and medium variant).	CSV	21	
WPP2006_SUP_F3_Annual Population Indicators_Percentage.csv	Percentage of total population by main age group, percentage urban and population density, by major area, region and country, annually for 1950-2050 (estimates and medium variant).	CSV	19	49,439
DB16. Interpolated annual populations by single age	Population (by sex and both sexes combined) interpolated by single years of age and single calendar years, by major area, region and country, annually for 1950-2050 (estimates and medium variant).			
WPP2006_INT_Population_Annual_Single_Medium.csv	Database format with sex and age in rows.	CSV	1	6,400,188
WPP2006_INT_Population_By_Sex_Annual_Single_Medium.csv	Database format with sex in column and age in row.	CSV	3	2,133,396
WPP2006_INT_Population_By_Age_Annual_Single_Medium.csv	Database format with sex in row and age from 0 to 100+ in column.	CSV	102	69,084

(1) File format is: CSV for ASCII comma delimited data files (.csv) with field names in header.

(2) Number of indicators does not include descriptive fields like codes and names for location, projection variant/scenario, calendar year or period, age group and/or sex.

UNITED NATIONS NATIONS UNIES

POPULATION DIVISION
Department of Economic and Social Affairs

World Population Prospects: The 2006 Revision - CD-ROM Edition

Date: _____

Order Form

CD-ROM requested

CD	Description	Price in US$	Quantity	Total Price in US$
[ ]	Comprehensive dataset (Excel format)	$250	…	…
[ ]	Extended dataset (Excel and ASCII formats)	$800	…	…
		Total	…	…

SHIP TO:

Name: .....

Institution: .....

Address: .....

.....

Telephone: ..... Fax No: .....

e-mail address .....

For overnight or express mail delivery, please provide a billing account number: .....…….....

Notes

1. Data contained in the above datasets are copyrighted by the United Nations. No portion of the data files contained on diskettes or CD-ROMs can be reproduced, distributed or used to prepare derivative works or for any other purpose without the express permission of the United Nations, to be obtained from the Secretary of the United Nations Publications Board. For further information, please contact the Director, Population Division/DESA, United Nations, New York, NY 10017, U.S.A., telephone no. 1-212-963-3179; fax no. 1-212-963-2147.

2. The order form should be accompanied by a cheque or an international money order in **US dollars drawn on a United States Bank** for the correct amount, payable to the UNITED NATIONS POPULATION DIVISION and mailed to: The Director, Population Division/DESA, United Nations, DC2-1950, New York, NY 10017, U.S.A. **Credit cards are not accepted**.

REFERENCES

Boerma, J. T., and others (2006). Monitoring the scale-up of antiretroviral therapy programmes: methods to estimate coverage. *Bulletin of the World Health Organization*, vol. 84, No. 2, pp. 145-150. URL: http://www.who.int/bulletin/volumes/84/2/145.pdf.

Garcia-Calleja, J. M., E. Zaniewski, P. D. Ghys, K. Stanecki and N. Walker (2004). A global analysis of trends in the quality of HIV sero-surveillance. Sexually Transmitted Infections (London), vol. 80, Supplement 1, pp. i25-i30. http://sti.bmjjournals.com/cgi/reprint/80/suppl_1/i25. Accessed on 2 December 2005.

Gleick, Peter H. (1995). Human Population and Water: To the Limits in the 21st Century. Washington, D.C.: American Association for the Advancement of Science. *http://www.aaas.org/international/ehn/fisheries/gleick.htm*. Accessed December 2007.

Grassly, N. C., M. Morgan, N. Walker, G. Garnett, K. A. Stanecki, J. Stover, T. Brown and P. D. Ghys (2004). Uncertainty in estimates of HIV/AIDS: the estimation and application of plausibility bounds. *Sexually Transmitted Infections* (London), vol. 80, Supplement 1, pp. i31-i38. http://sti.bmjjournals.com/cgi/reprint/80/suppl_1/i31. Accessed on 2 December 2005.

Hinrichsen, Don, Bryant Robey, and Ushma D. Upadhyay (1998). Solutions for a water-short world. *Population Reports*, vol. 27, no. 1.

International Energy Agency (2007). *Key World Energy Statistics 2007.* Paris. *http://www.iea.org/Textbase/nppdf/free/2007/key_stats_2007.pdf*. Accessed December 2007.

International Labour Office, Bureau of Statistics (2007). LABORSTA Internet. Geneva. *http://laborsta.ilo.org*. Accessed December 2007.

Lee, Ronald D., and Lawrence R. Carter (1992). Modeling and forecasting U.S. mortality. JASA: Journal of the American Statistical Association, vol. 87, No. 419, pp. 659-675.

Meyer, Perrin. 1994. "Bi-logistic Growth." Technological Forecasting and Social Change 47, 89-102. This article can be accessed at http://phe.rockefeller.edu/Bi-Logistic/.

Ratha, Dilip, and Zhimei Xu (2007). *Migration and Remittances Factbook.* Washington, D.C.: World Bank. *http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTDECPROSPECTS/0,,contentMDK:21352016~menuPK:3145470~pagePK:64165401~piPK:64165026~theSitePK:476883,00.html*. Accessed January 2008.

Ratha, Dilip, Sanket Mohapatra, K. M. Vijayalakshmi, and Zhimei Xu (2007). Remittance Trends 2007. Migration and Development Brief 3. Washington, D.C.: World Bank. *http://siteresources.worldbank.org/EXTDECPROSPECTS/Resources/476882-1157133580628/BriefingNote3.pdf*. Accessed January 2008.

Stover, J., and others (2006). Projecting the demographic impact of AIDS and the number of people in need of treatment: Updates to the Spectrum projection package. *Sexually Transmitted Infections*, vol. 82, Supplement 3: iii, pp. 45-50. URL: http://sti.bmj.com/cgi/content/abstract/82/suppl_3/iii45.

UNAIDS (2004). *2004 Report on the global AIDS epidemic*. Geneva: Joint United Nations Program on HIV/AIDS. http://www.unaids.org/bangkok2004/GAR2004_html/GAR2004_00_en.htm. Accessed on 2 December 2005.

_____(2006). *2006 Report on the global AIDS epidemic*. Geneva: Joint United Nations Program on HIV/AIDS. http://www.unaids.org/en/KnowledgeCentre/HIVData/GlobalReport/2006/default.asp. Accessed on 12 July 2007.

_____ (2007). *AIDS Epidemic Update: December 2007*. Geneva. *http://data.unaids.org/pub/EPISlides/2007/2007_epiupdate_en.pdf*. Accessed December 2007.

UNAIDS Reference Group on Estimates, Modelling and Projections (2002). Improved methods and assumptions for estimation of the HIV/AIDS epidemic and its impact: Recommendations of the UNAIDS Reference Group on Estimates, Modelling and Projections. *AIDS*, vol. 16, pp. W1-W14. URL: http://www.epidem.org .

UNAIDS, UNICEF, WHO (2007). *Children and AIDS - A Stocktaking Report. Actions and Progress during the First Year of Unite for Children, Unite against AIDS* (with Statistical Annexes). URL: www.unicef.org/uniteforchildren .

UNAIDS/WHO (2005). *AIDS Epidemic Update: 2005*. Geneva: Joint United Nations Program on HIV/AIDS and WHO. http://www.unaids.org/Epi2005/doc/report.html . Accessed on 2 December 2005.

UNESCO (2007). Data Centre. Paris. *http://stats.uis.unesco.org/unesco/TableViewer/document.aspx?ReportId=143&IF_Language=eng*. Accessed December 2007.

UNICEF (1991). World Declaration on the Survival, Protection and Development of Children and Plan of Action for Implementing the World Declaration on the Survival, Protection and Development of Children, both adopted at the World Summit for Children, September 30, 1990. Reprinted in United Nations Children's Fund, *The State of the World's Children 1991*. New York: Oxford University Press, pp. 51-74.

United Nations (1982). *Model Life Tables for Developing Countries* (United Nations publication, Sales No. E.81.XIII.7).

_____ (1983). *Manual X: Indirect Techniques for Demographic Estimation*. Population Studies, No. 81 (United Nations publication, Sales No. E.83.XIII.2).

_____ (1988a). *MORTPAK: The United Nations Software Package for Mortality Measurement: Batch-oriented Software for the Mainframe Computer* (United Nations publication, ST/ESA/SER.R/78).

_____ (1988b). *MORTPAK-LITE: The United Nations Software Package for Mortality Measurement: Interactive Software for the IBM-PC and Compatibles* (United Nation publication, Sales No. E.88.XIII.2).

_____ (1990). *Step-by-Step Guide to the Estimation of Child Mortality*. Population Studies, No. 107 (United Nations publication, Sales No. E.89.XIII).

_____ (2000). *United Nations Millennium Declaration*. General Assembly Resolution A/Res/55/2 on its Fifty-fifth Session, Agenda item 60 (b), 18 September 2000.

_____ (2001). *United Nations Declaration of Commitment on HIV/AIDS*. General Assembly Resolution A/Res/S-26/2 on its Twenty-sixth Special Session, Agenda item 8 on 2 August 2001.

_____ (2003). *World Population Prospects: The 2002 Revision*, vol. 3, *Analytical Report* (United Nations publication, Sales No. E.03.XII.10).

_____ (2004a). *World Population Prospects: The 2004 Revision, vol. I, Comprehensive Tables*. New York. (United Nations publication, Sales No. E.05.XIII.5).

_____ (2004b). *World Population to 2300*. New York. (United Nations publication, Sales No. E.04.XIII.11). http://www.un.org/esa/population/publications/longrange2/WorldPop2300final.pdf

_____ (2007a). Environmental indicators: Water: Water Resources: Long term annual average. *http://unstats.un.org/unsd/environment/waterresources.htm*. Accessed December 2007.

_____(2007b). United Nations Common Database (UNCDB). *http://unstats.un.org/unsd/cdb/cdb_help/cdb_quick_start.asp* . Accessed December 2007.

United Nations High Commissioner for Refugees (2007a). 2006 Global Trends: Refugees, Asylum-seekers, Returnees, Internally Displaced and Stateless Persons. Geneva. *http://www.unhcr.org/statistics/STATISTICS/478cda572.html*. Accessed December 2007.

_____ (2007b). UNHCR Statistical Online Population Database. Geneva. *http://www.unhcr.org/statistics/populationdatabase*. Accessed December 2007.

U.S. Census Bureau (2000). County and City Data Book: 2000. Washington, D.C. *http://www.census.gov/prod/www/ccdb.html*. Accessed December 2007.

World Health Organization and UNAIDS (2006). *Progress on Global Access to HIV Antiretroviral Therapy. A Report on "3 by 5" and Beyond*. URL: http://www.who.int/hiv/fullreport_en_highres.pdf .

Walker, N., J. Stover, K. Stanecki, E. Zaniewski, N. C. Grassly, J. M. Garcia-Calleja and P. D. Ghys (2004). The workbook approach to making estimates and projecting future scenarios of HIV/AIDS in countries with low level and concentrated epidemics. *Sexually Transmitted Infections* (London), vol. 80, Supplement 1, pp. i10-i13. http://sti.bmjjournals.com/cgi/reprint/80/suppl_1/i10. Accessed on 2 December 2005.

LIST OF PREVIOUS REVISIONS OF THE WORLD POPULATION PROSPECTS

"The past and future growth of world population—a long-range view", *Population Bulletin of the United Nations*, No. 1—December 1951 (United Nations publication, Sales No. 52.XIII.2), pp. 1-12.

"The past and future population of the world and its continents" and "Framework for the future population estimates, 1950-1980, by world regions", *Proceedings of the World Population Conference, 1954*, vol. III (United Nations publication, Sales No. 55.XIII.8), pp. 265-282 and 283-328.

The Future Growth of World Population (United Nations publication, Sales No. 66.XIII.2).

World Population Prospects as Assessed in 1973 (United Nations publication, Sales No. E.76.XIII.4 and corrigenda).

World Population Trends and Prospects by Country, 1950-2000: Summary Report of the 1978 Assessment (ST/ESA/SER.R/33).

Selected Demographic Indicators by Country, 1950-2000: Demographic Estimates and Projections as Assessed in 1978 (ST/ESA/SER.R/38).

World Population Prospects as Assessed in 1980 (United Nations publication, Sales No. E.81.XIII.8).

Demographic Indicators of Countries: Estimates and Projections as Assessed in 1980 (United Nations publication, Sales No. E.82.XIII.5 and corrigendum).

World Population Prospects: Estimates and Projections as Assessed in 1982 (United Nations publication, Sales No. E.83.XIII.5).

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

World Population Prospects 1988 (United Nations publication, Sales No. E.88.XIII.7).

The Sex and Age Distributions of Population: The 1990 Revision (United Nations publication, Sales No. E.90.XIII.33).

World Population Prospects: The 1990 Revision (United Nations publication, Sales No. E.91.XIII.4).

The Sex and Age Distribution of the World Populations: The 1992 Revision (United Nations publication, Sales No. E.93.XIII.3).

World Population Prospects: The 1992 Revision (United Nations publication, Sales No. E.93.XIII.7).

The Sex and Age Distribution of the World Populations: The 1994 Revision (United Nations publication, Sales No. E.95.XIII.2).

World Population Prospects: The 1994 Revision (United Nations publication, Sales No. E.95.XIII.16).

The Sex and Age Distribution of the World Populations: The 1996 Revision (United Nations publication, Sales No. E.98.XIII.2).

World Population Prospects: The 1996 Revision (United Nations publication, Sales No. E.98.XIII.5).

World Population Prospects: The 1998 Revision, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).

World Population Prospects: The 1998 Revision, vol. II, *Sex and Age Distribution of the World Population* (United Nations publication, Sales No. E.99.XIII.8).

World Population Prospects: The 1998 Revision, vol. III, *Analytical Report* (United Nations publication, Sales No. E.99.XIII.10).

World Population Prospects: The 2000 Revision, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.01.XIII.8 and corrigendum).

World Population Prospects: The 2000 Revision, vol. II, *Sex and Age Distribution of the World Population* (United Nations publication, Sales No. E.01.XIII.9 and corrigendum).

World Population Prospects: The 2000 Revision, vol. III, *Analytical Report* (United Nations publication, Sales No. E.01.XIII.20).

World Population Prospects: The 2002 Revision, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.03.XIII.6).

World Population Prospects: The 2002 Revision, vol. II, *Sex and Age Distribution of the World Population* (United Nations publication, Sales No. E.03.XIII.7).

World Population Prospects: The 2002 Revision, vol. III, *Analytical Report* (United Nations publication, Sales No. E.03.XIII.10).

World Population Prospects: The 2004 Revision, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.05.XIII.5).
World Population Prospects: The 2004 Revision, vol. II, *Sex and Age Distribution of the World Population* (United Nations publication, Sales No. E.05.XIII.6).
World Population Prospects: The 2004 Revision, vol. III, *Analytical Report* (United Nations publication, Sales No. E.05.XIII.7).
World Population Prospects: The 2006 Revision, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.07.XIII.2).
World Population Prospects: The 2006 Revision, vol. II, *Sex and Age Distribution of the World Population* (United Nations publication, Sales No. E.05.XIII.3).