Economic & Social Affairs

WORLD POPULATION MONITORING 1999

Population growth, structure and distribution

United Nations

ST/ESA/SER.A/183

DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
POPULATION DIVISION

WORLD POPULATION MONITORING 1999

Population growth, structure and distribution

United Nations • New York, 2000

NOTE

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The term "country" as used in the text of this publication also refers, as appropriate, to territories or areas.

The designations "more developed", "less developed" and "least developed" for countries, areas or 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.

ST/ESA/SER.A/183

UNITED NATIONS PUBLICATION

Sales No. E.00.XIII.4

ISBN 92-1-151342-1

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PREFACE

The Economic and Social Council, in its resolution 1995/55 of 28 July 1995 setting out the topic-oriented work programme of the Commission on Population and Development, decided that the topic for the deliberations at its 1999 session should be "Population growth, structure and distribution". The subject was chosen to complement the topics for previous Commissions ("Reproductive rights and reproductive health" in 1996, "International migration and development" in 1997, and "Health and mortality" in 1998), so that the reports prepared from 1996 to 1999, taken together, would provide a broad review of trends and policy issues in key areas covered in the Programme of Action of the International Conference on Population and Development,[1] and provide a foundation for the five-year review and appraisal of progress in implementation of the Programme of Action in 1999.[2]

As requested by the Council, the Population Division of the Department of Economic and Social Affairs annually prepares the world population monitoring report on the topic of that year's session of the Commission. The full report is accompanied by a summarized version, the "concise report" (E/CN.9/1999/2). Each of these reports is presented and discussed at the Commission and then revised for publication. Presented here is the revised version of the full report on the theme "Population growth, structure and distribution".

The revised report provides recent information and policy perspectives on population growth and its components of fertility, mortality and international migration; population age structures, including socio-economic aspects; population distribution, urbanization and internal migration; and the relationship of population growth to economic growth, poverty, food and the environment. The report also contains an appendix on data collection, data availability and data quality.

The report contains an extensive set of annex tables providing indicators of the current demographic situation in major areas and regions, as well as data on population size and growth, population distribution, fertility and mortality levels, and population policies in countries, major areas and regions.

The report was prepared by the Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat. Acknowledgements are due to Professor Allen Kelley of Duke University for his contributions to chapter V on population growth, economic growth, poverty, food and the environment; and to the Statistics Division of the Department of Economic and Social Affairs for preparation of the appendix on data collection, data availability and data quality.

Comments and suggestions on this report are welcome and may be addressed to the Director, Population Division, Department of Economic and Social Affairs, United Nations Secretariat, New York, N.Y. 10017, fax number (212) 963-2147.

NOTES

[1] *Report of the International Conference on Population and Development, Cairo, 5-13 September 1994* (United Nations publication, Sales No. E.95.XIII.18), chap. I, resolution 1, annex.

[2] *Review and Appraisal of the Progress Made in Achieving the Goals and Objectives of the Programme of Action of the International Conference on Population and Development* (ESA/P/WP.148; E/CN.9/1999/PC/2).

SOURCES, METHODS AND CLASSIFICATIONS

Data on demographic trends used in the present report are taken from the official United Nations population estimates and projections contained in *World Population Prospects: The 1998 Revision.*[1] These population estimates and projections, which are prepared biennially by the Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, provide the standard and consistent set of population figures that are used throughout the United Nations system as the basis for activities requiring population information. Population policy data are taken from the Population Policy data bank maintained by the Population Division, *Global Population Policy Database, 1997*[2] and updates, from *Results of the Seventh United Nations Population Inquiry Among Governments*[3] and from available results of the Eighth Inquiry.

In the case of the United Nations estimates and projections, the estimates were made by collecting, evaluating and adjusting, as necessary, all available data for the period 1950-1998. For the period 1995-2050, figures are mostly the result of projections from the year 1995, except for such cases where more recent reliable data are available.

The countries and areas, which are identified as the statistical units by the United Nations Statistics Division and covered by the estimates and projections mentioned above, are grouped geographically into six major areas: Africa, Asia, Europe, Latin America and the Caribbean, Northern America and Oceania. Those major areas are further divided geographically into 21 regions. In addition, the regions are summarized, for statistical convenience, into two general groups—more developed and less developed—on the basis of demographic and socio-economic characteristics. The less developed regions include all regions of Africa, Asia (excluding Japan), Latin America and the Caribbean, Melanesia, Micronesia and Polynesia. The more developed regions comprise Northern America, Japan, Europe and Australia/New Zealand. Other regional groupings are used as appropriate to the subject matter.

NOTES

[1]United Nations publication, Sales No. E.99.XIII.9, vol. I; and E.99.XIII.8, vol. II.
[2]United Nations publication, Sales No. E.96.XIII.11.
[3]United Nations publication, ST/ESA/SER.R/140.

CONTENTS

	Page
Preface	iii
Sources, methods and classifications	iv
Explanatory notes	ix
Chapter	
I. OVERVIEW	1
II. POPULATION GROWTH AND ITS COMPONENTS	6
A. Population growth: past trends and future prospects	6
B. Levels and trends of fertility and its determinants	13
C. Levels and trends of mortality and its determinants	16
D. International migration and its impact on population growth	21
E. Government views and population policies	26
III. CHANGING POPULATION AGE STRUCTURES	34
A. Demographic aspects	34
B. Socio-economic aspects	43
C. Government views and population policies	49
IV. POPULATION DISTRIBUTION, URBANIZATION AND INTERNAL MIGRATION	54
A. Levels and trends of internal migration	54
B. Past trends and future prospects for urban, city and rural population growth	68
C. Government views and population policies	74
V. POPULATION GROWTH, ECONOMIC GROWTH, POVERTY, FOOD PROVISION AND THE ENVIRONMENT	78
A. Impact of population growth on economic growth	78
B. Poverty	80
C. Food	84
D. The environment	86
E. Conclusions: population policies in perspective	90
Appendix. Basic data collection, data availability and data quality	95
A. Population censuses	95
B. Surveys	97
C. Administrative records	98
D. Conclusions	100

TEXT TABLES

No.		*Page*
II.1.	Population, world and major areas, 1750-2050	7
II.2.	World population estimates, 1950, 1970 and 1998; projections by variants, 2015-2050	8
II.3.	Population size for the more developed and less developed regions and least developed countries: estimates for 1950, 1970 and 1998; and medium-fertility-variant projection for 2050	10

No.		Page
II.4.	Distribution of countries according to population size, by major area, 1998	12
II.5.	Distribution of countries according to population growth rate, by major area, 1995-2000	13
II.6.	Distribution of countries according to level of total fertility rate, by major area, 1970-1975 and 1995-2000	15
II.7.	Population according to projected life expectancy in 2005, by major area, 1998	18
II.8.	Distribution of countries according to different indicators of international migration and population growth, 1970-1995	22
II.9.	Countries with a large net number of international migrants during 1970-1995	23
II.10.	Countries or areas with very high or very low net migration rates during 1970-1995	24
II.11.	Countries or areas with very high or very low levels of net migration as a percentage of natural increase during 1970-1995	25
II.12.	Governments' views of population growth rate, 1974-1998	27
II.13.	Governments' views of population growth rate, by level of development, 1983-1998	27
II.14.	Governments' policies on population growth rate, 1974-1998	27
II.15.	Governments' policies on population growth rate, by level of development, 1983-1998	30
III.1.	Estimated and projected regional distribution of the population under age 15 and aged 60 or over, 1970, 1998 and 2050	34
III.2.	Estimated and projected percentage of the population in selected age groups, by region	36
III.3.	Sex ratios by age in the more and the less developed regions, 1998	40
III.4.	Trends in age-dependency ratios, by region, 1970 to 2050	41
III.5.	Labour-force participation rates of older men and women, more developed and less developed regions, 1995	46
III.6.	Standard retirement age, around 1997	47
IV.1.	Intra-state and inter-state migrants by sex, selected developing countries	55
IV.2.	Migrants, by sex and type of flow, according to urban or rural origin or destination	58
IV.3.	Interdistrict migrants by type of migration flow and period of migration, Republic of Korea, 1961 to 1990	62
IV.4.	Estimates of the components of urban growth	63
IV.5.	Estimates of the components of urban growth at the regional level	66
IV.6.	Distribution of total, urban and rural population of the world between more developed and less developed regions, 1970, 1998 and 2030	69
IV.7.	Average annual population increment, 1970-1998 and 1998-2030	70

No.		Page
IV.8.	Sex ratios of population in urban and rural areas, 1995	72
IV.9.	The 15 largest urban agglomerations ranked by population size, 1970, 1998 and 2015	73
IV.10.	Governments' views on spatial distribution by level of development and major area, 1998	74
V.1.	Recent poverty trends	82
V.2.	Changes in poverty, 1960-1986	83

APPENDIX TABLES

No.		Page
A.	Number of countries having conducted a census during the 1950, 1960, 1970, 1980 and 1990 census decades, by region	96
B.	Major topics covered by population and housing censuses in the 1980 and 1990 census decades	97
C.	Number of countries by completeness of birth and death registration	99

ANNEX TABLES

No.		Page
A.1.	Population size, 1998, and components of growth, 1995-2000, major areas and regions	103
A.2.	Rates of population growth, fertility, mortality and net migration, major areas and regions, 1995-2000	104
A.3.	Births by age of mother and deaths by age, major areas and regions, 1995-2000	105
A.4.	Infant and child mortality estimates, major areas and regions, 1995-2000	106
A.5.	Age composition of the population, major areas and regions, 1998	107
A.6.	Countries or areas with the largest and the smallest population size, 1998	108
A.7.	Countries or areas with the highest and the lowest fertility, 1995-2000	108
A.8.	Countries or areas with the highest and the lowest life expectancy, 1995-2000	109
A.9.	Countries or areas with the highest and the lowest infant mortality rate, 1995-2000	110
A.10.	Trends in population size and growth for major areas, regions and countries, 1975-2015, and Governments' views and policies on population growth and immigration	111
A.11.	Fertility trends, major areas, regions and countries, 1970-2000, and Governments' views and policies on fertility	119
A.12.	Age pattern of fertility, major areas, regions and countries, 1995-2000	124
A.13.	Trends in percentage of married women using contraception, major areas, regions and countries	130
A.14.	Trends in life expectancy, major areas, regions and countries, 1970-2000	134
A.15.	Trends in infant mortality, major areas, regions and countries, 1995-2000	139

FIGURES

No.		Page
II.1.	Long-term world population growth, 1750 to 2050	8
II.2.	World population size: past estimates and medium-, high- and low-fertility variants, 1950-2050	9
II.3.	World population growth rates: past estimates and medium-, high- and low-fertility variants, 1950-2050	10
II.4.	Female population aged 15-49, for the world and the more and less developed regions, 1970-2050	14
II.5.	Mortality rates at older ages for females in Denmark, Finland, Norway and Sweden combined, 1930-1949 and 1989-1993	17
II.6.	Life expectancy projected for 2005, by country ranking and region	19
II.7.	Age distribution of deaths for the more developed and less developed regions, 1995-2000	20
II.8.	Plot of countries according to rate of net migration and rate of natural increase, 1970-1995	26
II.9.	Governments' views on population growth rate, 1983-1998	28
II.10.	Governments' policies on population growth rate, 1983-1998	29
III.1.	Geographic distribution of the population under age 15 and aged 60 or over, 1998 and 2050	35
III.2.	Population pyramids: age and sex distribution, 1998 and 2050	37
III.3.	Growth in population size and age-specific annual growth rates, for the child, youth and older populations, 1970-2050	38
III.4.	Percentage of the world population under age 15, aged 60 or over and aged 80 or over, 1970-2150	39
III.5.	Estimated projected trends in age-dependency ratios in selected countries	42
III.6.	Time when the percentage of the population aged 65 or over reached or will reach 7, 14 and 21 per cent: selected countries	43
III.7.	Labour-force participation rates, men aged 60-64, 1960 to 1995	45
IV.1.	Percentage of population residing in urban areas, 1970, 1998 and 2030	68

BOXES

III.1.	Home alone? Living arrangements and family support among the elderly in Asia	48
V.1.	Government views regarding population and the environment	89

Explanatory notes

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

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

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

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

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

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

A point (.) is used to indicate decimals.

A slash (/) indicates a crop year or financial year, e.g., 1990/91.

Use of a hyphen (-) between dates representing years, e.g., 1990-1992, signifies the full period involved, including the beginning and end years.

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

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

The term "billion" signifies a thousand million.

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

I. OVERVIEW

In the quarter-century since the 1974 World Population Conference was held in Bucharest, the demographic situation of the world has undergone striking changes. World population size has increased from 4 billion persons to nearly 6 billion in 1998. At the same time, the world population growth rate has fallen from around 2 per cent per year in 1970-1975 to 1.3 per cent in 1998; the average number of children per couple has fallen from 4.5 to 2.7; and life expectancy at birth has risen from 58 to 65 years. The share of the world's population living in urban areas has increased from 36 per cent to 47 per cent and the number of mega-cities of 10 million persons or more has multiplied from five to 18. The number of persons who have moved to another country has risen to over 125 million in 1998.

The demographic transition (i.e., the transition from high to low birth and death rates) has not proceeded similarly in all countries. In 1974, the transition was well under way or nearly completed in many countries and had barely begun in others. Although by 1998 this transition had occurred or was occurring in nearly every country, the timing and pace of the transition varied. And in some regions and countries, steps backward are now occurring. For example, AIDS and other emerging diseases in some countries and economic and political dislocations in others have reversed past progress in improving health and reducing mortality.

The present publication, *World Population Monitoring, 1999*, reports on population growth, structure and distribution and reviews the demographic changes in population size in the world and its urban and rural areas, and the changes in mortality, fertility and migration that underlie these changes. It also examines the population policies that Governments have adopted in response to their concerns regarding national aspects of population and development. The report concludes with a review of the state of knowledge on the interrelationships of population with poverty, food and the environment.

Knowledge of demographic change and its interrelationships with aspects of development need to be based on timely data of high quality. The appendix reviews the state of data collection around the world and the need for more resources and more attention to this area if national and international population and development policies are going to be effectively targeted and devised and reliably monitored. The principal data-collection systems for demographic and social information are population censuses, sample surveys and civil registration systems. These systems have provided the primary means for measuring basic demographic parameters such as the size and growth of populations, components of growth and vital rates. Although international migration is an important source of demographic change, statistics on immigration and emigration are not available for many countries on a regular basis.

Population censuses remain the most important source of key demographic information at all geographic levels for planning and implementation of development programmes. In the 1990 census decade 200 countries and areas carried out censuses, amounting to 95 per cent coverage of the world's population. The challenge that countries are facing for the 2000 round is how to mobilize resources to conduct future population censuses and to look beyond the traditional sources of financing census activities by involving all sectors of civil society.

Sample surveys are an important tool for obtaining detailed demographic and social data, particularly with respect to fertility and mortality. However, surveys normally cannot provide data at small geographical levels and therefore are not a substitute for censuses. Nonetheless, because of the smaller scale, surveys have greater depth than a census, tend to employ better qualified and trained enumerators than censuses do, and for fertility and mortality data are generally found to be relatively more reliable than the census. When a complete and reliable civil registration system exists in a country, it is the ideal source of information on the levels and patterns of fertility, mortality and nuptiality needed to monitor population growth and assess the health situation of the population, including maternal, child and infant death for the country as a whole, its regions, subregions and communities. The main advantages of civil registration are its continuity, permanency and country-wide scope. Unfortunately, in many developing countries registration is either weak or almost entirely lacking.

The world population in 1998 is 5.9 billion persons, growing at a rate of 1.3 per cent annually. Each year, about 78 million persons are being added to the world. In the United Nations medium-fertility-variant projection, which is considered to be the most likely, world population will reach 8.9 billion in 2050. In 1998, four out of five people in the world (4.7 billion) live in the less developed regions, while 20 per cent (1.2 billion) live in the more developed regions. About 96 per cent (74 million) of the total annual population increase originates in the less developed regions of the world.

Annual population growth rates vary widely among countries, from negative growth among some Eastern Eu-

ropean countries to very high growth rates among some Asian and African countries. In 1998, there are 24 countries, comprising 1.7 per cent of the world population, which exhibit average annual growth rates of 3.0 per cent or higher. At the other end of the spectrum, 24 countries, with 6.1 per cent of the global population, have declining populations.

Since 1970-1975 world total fertility has declined by 39 per cent, from 4.5 births per woman to the current level of 2.7 births per woman. In the less developed regions women are currently having more than two fewer children than they did three decades ago. The average number of births per woman in the less developed regions declined from 5.4 during 1970-1975 to 3.0 in 1995-2000. In the more developed regions, fertility declined from 2.1 births per woman during 1970-1975 to a historical low of 1.6 for the current period, 1995-2000. Even though fertility has declined to relatively moderate levels in many developing countries, and to below replacement level in some, a large and growing number of live births are occurring annually, owing to the continued growth in the number of women of childbearing age, a legacy of past high-fertility levels. In the less developed regions, the average number of births per year was 104 million in 1970-1975; the annual number has grown to 117 million births today.

Total fertility rates range from 1.4 and 1.9 births per woman in Europe and Northern America respectively, to 5.1 in Africa. Rates for Asia and for Latin America and the Caribbean fall in-between, at 2.6 and 2.7 births per woman respectively. The data show that as many as 60 countries began their fertility transition after 1970-1975, nearly half the countries (28) being in Africa, 19 in Asia and nine in Latin America and the Caribbean. Even among countries that exhibited low fertility 30 years ago, rates have continued to decline. In 22 countries of Europe and Northern America, the current fertility rate is 1.5 births per woman or below. Bulgaria, the Czech Republic, Italy, Romania and Spain have an average of just 1.2 births per woman in 1995-2000, while in Estonia, Latvia, Germany, Greece, the Russian Federation and Slovenia the average total fertility rate is 1.3 births per woman.

Even though there is a broad agreement about conditions that favour the onset of the fertility transition, there is no consensus regarding specific conditions that need to be present for the transition to begin. In countries where fertility has started to decline, a significant increase in contraceptive prevalence was an important contributing factor. Other factors associated with fertility decline include a decline in levels of child mortality, increased levels of education among women, increased urbanization and increases in age at marriage. However, each of these principal factors does not always autonomously lead to fertility decline, nor are these factors always collectively associated with changes in fertility levels. In the post-transition countries, where fertility is increasingly becoming lower, the increased status of women appears to be one of the important determinants of continued low fertility.

At the global level, the continuing progress in the reduction of mortality is revealed in the increase of life expectancy at birth from 58 years prior to the 1974 World Population Conference to 65 years today, and the simultaneous decline of infant mortality from 93 per 1,000 live births to 57. The causes of recent national mortality trends include a large array of factors. The medical and hygienic interventions to combat or prevent infectious and parasitic diseases were largely responsible for the rapid decreases in communicable diseases and ensuing mortality declines, especially among children, that many developing countries have experienced since the 1960s. However, the war against communicable diseases is not won yet. Globally, infectious and parasitic diseases, respiratory infections, malnutrition, and maternal and neonatal mortality account for more than 40 per cent of all deaths. Recent years have shown a devastating toll from AIDS in a number of countries, particularly in sub-Saharan Africa. In many African countries, AIDS has greatly increased infant and child mortality and reduced life expectancy.

Decreasing mortality from cardiovascular diseases and neoplasms in many of the more developed countries during recent decades was made possible by advances in medical treatment and beneficial changes in lifestyles. However, some of the countries of Eastern Europe have been experiencing a stagnation of mortality improvement and even declines in national life expectancies. Mortality in these countries has been particularly high among adult males, due to non-communicable diseases, accidents, injuries and violent deaths.

During the twentieth century, the contribution of net migration to population growth has been of minor demographic importance for most countries, especially for those where natural increase has been high. However, the marked reduction of fertility experienced by a growing number of countries has implied that the role of international migration in determining population growth has been rising. For developed countries in particular, the low levels of fertility that have prevailed over recent periods have meant that moderate or even low levels of international migration have had a significant impact on rates of population growth. Over half of the countries of the world have exhibited out-migration since 1970. Countries or areas where net migration contributed to population growth by a significant amount were of two types: (*a*) countries with relatively small populations and moderate to high rates of natural increase; and (*b*) countries with very low rates of natural increase. Both types have characteristically fostered the admission of international migrants since 1970. They included the main traditional countries of immigration and many of the European market-economy countries.

It has been suggested that emigration tends to be higher where population growth rates are high. However, the data show that although at very low levels of natural increase (below 0.5 per cent) countries appear more likely to experience immigration rather than emigration, at high levels of natural increase, there are numerous countries

experiencing both net immigration and emigration. There is no simple relationship between rates of natural increase and net international migration. Analyses suggest that a rapid rate of population growth, on its own, does not necessarily lead to increased emigration.

Continued high rates of population growth remain an issue of policy concern for many countries of the world, although fewer countries are now expressing a concern than at the time of the 1994 International Conference on Population and Development. In fact, in response to low levels of fertility in a growing number of countries, and the social and economic consequences of the resultant population ageing, more countries are expressing concern about their low rates of population growth. The proportion of Governments which consider their rate of population growth to be too high declined from 44 per cent in 1993 to 41 per cent in 1998. In parallel, the proportion of Governments perceiving their growth rate to be too low increased from 11 per cent in 1993 to 14 per cent in 1998.

The proportion of Governments that have policies aimed at influencing population growth increased from 45 per cent in 1974 to 56 per cent in 1998: 70 Governments (39 per cent) have policies aimed at lowering population growth, while 27 (15 per cent) have policies aimed at increasing population growth. In developing countries, during the 15-year period 1983-1998, the proportion of Governments intervening to influence population growth increased from 58 per cent to 65 per cent. The proportion of Governments of developed countries intervening to influence population growth declined between 1983 and 1993. However, it increased between 1993 and 1998 because a number of countries with policies of non-intervention or policies designated to maintain the rate of population growth shifted to a policy of increasing population growth.

The world child population, i.e., those under age 15, stood at 1.8 billion in 1998. Children make up 19 per cent of the population of more developed regions and 33 per cent of less developed regions. Ages 15-24 represent a transition from childhood to adulthood. Rapid growth in the number of young people means rapid growth in the demand for secondary and higher education, jobs and housing. World youth numbered 1 billion in 1998 (almost 60 per cent more than in 1970), and by 2050, youth are projected to number 1.3 billion.

Although the world population of older persons is considerably smaller than the child population, it is growing at a much faster rate. In 1998, there were 580 million persons aged 60 years or over in the world, or 10 per cent of world population. By 2050, this figure will triple to nearly 2 billion, when it will be larger than the child population. The older population is increasing at a substantially faster rate in the less developed than in the more developed regions. The oldest old, persons aged 80 or more, are the fastest-growing segment of the older population. By 2050, the number of oldest old is projected to be 5.6 times larger than at present (66 million) and will be 4 per cent of world population. In more developed regions, one person in 11 will be aged 80 or more.

Changing age structure will have wide-ranging economic and social consequences through such factors as economic growth, savings and investment, labour supply and employment, pension schemes, health and long-term care, intergenerational transfers, family composition and living arrangements. While once limited to developed countries, concern for the consequences of ageing has spread to developing countries.

Another major transformation during the twentieth century has been the growth of urban centres and the concentration of population in urban areas. As of mid-1998, 47 per cent of the world population lived in urban areas and the urban population was growing at 2.3 per cent per year. Since the 1960s rural-urban migration has accounted for about 40 per cent of urban growth. The urban population is growing three times faster than its rural counterpart. As a result, half of the world population is expected to be urban by 2006. Moreover, approximately three fifths will be living in urban areas by 2030.

The giant urban agglomerations, a recent phenomenon, are becoming both larger and more numerous. The largest cities in the world in 1998 were Tokyo, with a population of 28 million, Mexico City (18 million), São Paulo (17 million) and Bombay (17 million). By 2015, Lagos will be the third largest in the world (24.6 million), after Tokyo (29 million) and Bombay (26 million). Between 1970 and 1998, the number of cities with 10 million or more inhabitants grew from 3 to 18. Of the 18 cities with 10 million or more inhabitants in 1998, two are in Africa (Lagos and Cairo), four in Latin America and the Caribbean, two in Northern America and 10 in Asia. It is projected that by 2015, there will be 26 cities with a population of 10 million or more (four in the more developed regions and 22 in the less developed regions). However, half of the world's urban population still lives in smaller cities with fewer than 500,000 inhabitants.

The urbanization trends experienced by developed countries until the 1950s suggested that the increasing concentration of the urban population in ever larger urban centres was a natural concomitant of the rising proportion of people living in urban areas. However, between 1965 and 1985, a tendency towards "counter-urbanization", a process whereby larger metropolitan areas lost population in relative terms to smaller urban centres, was noticed in a number of developed countries. Despite the expectation that the shift away from population concentration in the larger metropolitan areas to that in medium-sized and small settlements would accelerate during the 1980s, recent evidence has failed to corroborate such a trend and suggests that the tendency towards population concentration in the larger urban places has returned.

The movement of people from rural to urban areas is only one of the possible forms of internal migration. In fact, data show that rural-urban migration does not account for the largest proportion of internal migrants. In countries such as Ethiopia, India and Thailand, which are

still largely rural, rural-rural migration is more important; whereas in countries that are highly urbanized, urban-urban migration dominates. That is, although rural-urban migration and its counterpart, urban-rural migration, contribute to a redistribution of population between urban and rural areas, at certain stages of the urbanization process the other types of migration (rural-rural and urban-urban) may be more important in the redistribution of population within geographical strata.

In 1998, 44 per cent of Governments considered their patterns of population distribution to be a major concern. Another 29 per cent saw their patterns of population distribution to be a minor concern. In many developing countries, population distribution policies are largely synonymous with measures to reduce or even to attempt to reverse rural-urban migration, with the aim of controlling the growth of the primate city or other large metropolitan areas. Evidence indicates that these policies have not always been effective. Partially in response, many countries have adopted strong rural-oriented spatial policies. Whereas many Governments throughout the developing world have strongly endorsed the concept of promoting small and medium-sized cities, it is far from clear how that should be done. A number of Governments have also in recent years adopted policies that seek to work alongside market forces—by channelling private investment to designated areas, providing infrastructure in under-served areas, or removing subsidies that previously favoured the residents of certain locations such as the national capital. The idea behind this approach is to create a "level playing field" whereby a number of areas of a country are equally attractive to potential migrants. Mega-city size, on its own, may not always be a critical policy variable. The key challenge is to manage mega-city growth efficiently. Management of urban growth becomes more important as the integration of the world economy and the expansion of international trade and investment changes the bases of urban economic growth in the twenty-first century.

Debates surrounding the consequences of population growth for the pace of economic development have been both vigorous and contentious. The impacts of rapid population growth have been judged to vary considerably by country and over time, and have been considered to be relatively small by comparison with other determinants of economic prosperity. Nonetheless, there is a general view that the rapid population growth of many developing countries makes it more difficult for these countries to achieve improvements in the standard of living as well as to protect their environments.

There are arguments to suggest that, as fertility declines and the proportion of the population in the economically most productive ages rises, resources thereby freed from care for a larger child population can be productively directed to increased labour-force participation (especially of women) and increased investment in both physical and human capital, thereby speeding economic development. An influential study by the United States of America's National Research Council, in 1986, reached the "qualitative conclusion that slower population growth would be beneficial to the economic development of developing countries". In contrast to earlier studies, which found weak and inconsistent relationships between population increase and economic growth, some recent assessments have revealed fairly large, economically important, negative correlations between population change and per capita output growth based on data for the 1980s or later and for the entire period from the 1960s through the early 1990s. The negative effect of high fertility on economic growth also appeared greater for poorer countries. Recent results also indicate that declining fertility may contribute to reductions in poverty.

Government policies condition the form and the size of the impact of population on the economy. Unfortunately, very little is known about how Governments react to rapid population growth, apart from policies aimed at influencing population growth itself. The Programme of Action of the International Conference on Population and Development reflected a consensus that slower population growth buys time for Governments to adjust (para. 3.14). However, slowing population growth does not itself ensure that favourable policy and institutional changes will occur. The time "bought" by slower population growth may be squandered if needed policy changes are not made.

It is widely believed that the most important factor accounting for poverty is the macroeconomic environment and, especially, factors that govern the growth of employment. To the extent that macroeconomic growth is adversely influenced by the pace of demographic change, then poverty will be adversely impacted by rapid population growth as well. Studies have not firmly established notable effects of demographic change on poverty rates. Indeed, data on poverty levels are too sparse to study this issue over time for most countries. However, a recent study found that higher fertility, with a lag, was associated with higher absolute poverty both through slower economic growth and through a skewing of the distribution of consumption against the poor. There is evidence from many societies that poor families or households tend to have a larger number of children and also that children in large families tend to have poorer health and survival probabilities. They also tend to perform less well in school and, in some settings, to receive less education.

In the face of notable demographic pressures in the future, a comparison of population with carrying capacity estimates indicates that persistent food shortages can be avoided, albeit with improvements in and prudent management of rural-sector production. An important element in food provision is the need to reckon the growing environmental costs. Deforestation constitutes the most conspicuous example of environmental change associated with farming. Studies across many countries and ecological settings reveal a positive correlation between deforestation and population growth.

Many Governments view their population size, growth or distribution as a cause for concern in relation to envi-

ronmental problems. For countries responding to the United Nations Eighth Inquiry on Population Policies, water pollution, the amount of fresh water available and the deterioration of the urban environment were the areas over which serious concern was most often expressed regarding the impact of population. In the less developed regions, around 90 per cent of responses indicated either a major or a minor concern over population in relation to those three areas. Population size or trends were viewed as a serious concern by close to half, and as a minor concern by another one fourth of Governments, in relation to air pollution, forests, degradation of agricultural land and biodiversity. Population's role was a serious concern for about one third and a minor concern for an additional one fourth of countries with respect to the amount of agricultural land, coastal areas, dry areas and hilly or mountainous zones.

Rarely do Governments seek a solution to environmental problems solely through altering population trends or distribution. In many cases, though, Governments report a policy approach that combines measures to affect population trends or distribution with other approaches to alleviating environmental problems. The impacts of demographic change can best be viewed as "amplifying" the impacts deriving from more fundamental causes of environmental degradation. However, population policies that reduce fertility will certainly buy some time, which is particularly needed in this area since the institutional and policy changes required are both extensive and exceptionally difficult to effect politically.

In summary, poverty reduction, food provision and environmental maintenance are integrally linked with demographic, economic and political change. "Vicious circles" of cumulatively worsening performance in each of the latter two dimensions may be exacerbated by rapid population growth. Government policies that promote income growth, empower the poor with education and health, and provide incentives to behave prudently in the allocation of resources can help to break this interacting web. Such policies can lead to "virtuous circles" of cumulatively improving performance in all three dimensions. In such a situation, children are less likely to be seen as producing agents, women's and men's roles change, and the demand for reproductive health services increases. Economic and demographic change are mutually interacting forces influenced by institutional settings and government policy. As a result, population policies are an important element of the policy-making components needed to advance economic development, eliminate poverty and foster long-run environmental stewardship.

II. POPULATION GROWTH AND ITS COMPONENTS

A. POPULATION GROWTH: PAST TRENDS AND FUTURE PROSPECTS

1. *The world*

The mid-year world population in 1998 is estimated to be 5.9 billion, growing at a rate of 1.3 per cent annually (United Nations, 1999). Each year, about 78 million persons are being added to the world.

The current world population size is the result of a historically short and unprecedented period of accelerated population growth (see table II.1). Before the twentieth century, world population grew only slowly, if at all. Historical estimates (United Nations, 1973) suggest, for instance, that world population in 1750 was about 791 million people, with annual population growth rates still below half a per cent. Moderate population growth (below 0.6 per cent per year) prevailed during the rest of the eighteenth and throughout the nineteenth century. Accelerated population growth, with growth rates passing the 1 per cent mark in the 1920s and ultimately peaking, at 2.04 per cent, in the late 1960s, is clearly a phenomenon of the twentieth century.

The accelerating pace of population growth can be illustrated by the time it took to add 1 billion people to the world population. From 1804, when the world passed the 1 billion mark, it took 123 years to reach 2 billion people, 33 years to add another billion people to reach 3 billion people in 1960, 14 years to reach 4 billion, and just 13 years to achieve 5 billion in 1987. It is estimated that the 6 billion mark will be passed in 1999, after only 12 years of continued population growth.

Between 1970 and 1998, during just 28 years, the number of people grew from 3.7 billion to 5.9 billion, an increase of more than 2.2 billion. Figure II.1 shows, together with future projections, the evolution of the world population since 1750, together with the increments that were added to the world's population each decade. It illustrates that world population growth, although still very high, is also undergoing dramatic changes. As the results of the recent United Nations population projections suggest, annual population increments passed their peak between 1985 and 1990, when 86 million people were added annually. This period of highest absolute population increase came about 20 years after the average annual population growth rate peaked, between 1965 and 1970, at 2.0 per cent.

Long periods of sustained population growth also create the conditions for continued growth. When populations grow fast, cohorts of ever-increasing size are being added to a population, resulting in very young age structures. In such settings, even replacement levels of fertility would translate into continuing, though decelerating, population growth because the number of people in reproductive age still increases. Therefore, not only do past population dynamics materialize in today's population size and its age and sex composition, but they have also a bearing on future trends.

This effect has been demonstrated in a recent projection exercise that extended the *1996 Revision* of the official United Nations population estimates and projections up to the year 2150 (United Nations, 1998). In it, a hypothetical "instant replacement scenario" was calculated that sets fertility to the replacement level beginning in 1995, but leaves all other settings unchanged. In such a scenario, each cohort will just replace itself, but populations will continue to grow because of increasing cohorts that enter the reproductive ages. The results showed that the world population would continue to grow by "momentum" from its size of 5.7 billion in 1995 to 8.6 billion in 2050 and to almost 9.5 billion in 2150. Yet, even with past trends influencing future trends, population growth is not destiny. It is the result of individual decisions based on values, expectations and resources; it is framed by dynamic social, economic and political conditions. Their complex interactions to a large extent explain past population dynamics, as they determine how future trends will be shaped.

The Population Division regularly prepares, in its biennial world population estimates and projections, three variants of population projections that intend to frame a plausible range of future population trends, with the medium variant depicting, at least for a medium time period, the most likely trajectory. These variants are based on past trends and future developments regarding fertility, mortality and migration, and are carried plausibly forward to the year 2050. While assumptions regarding trends in mortality and migration do not vary among the three variants, different assumptions are made with respect to future fertility trends.

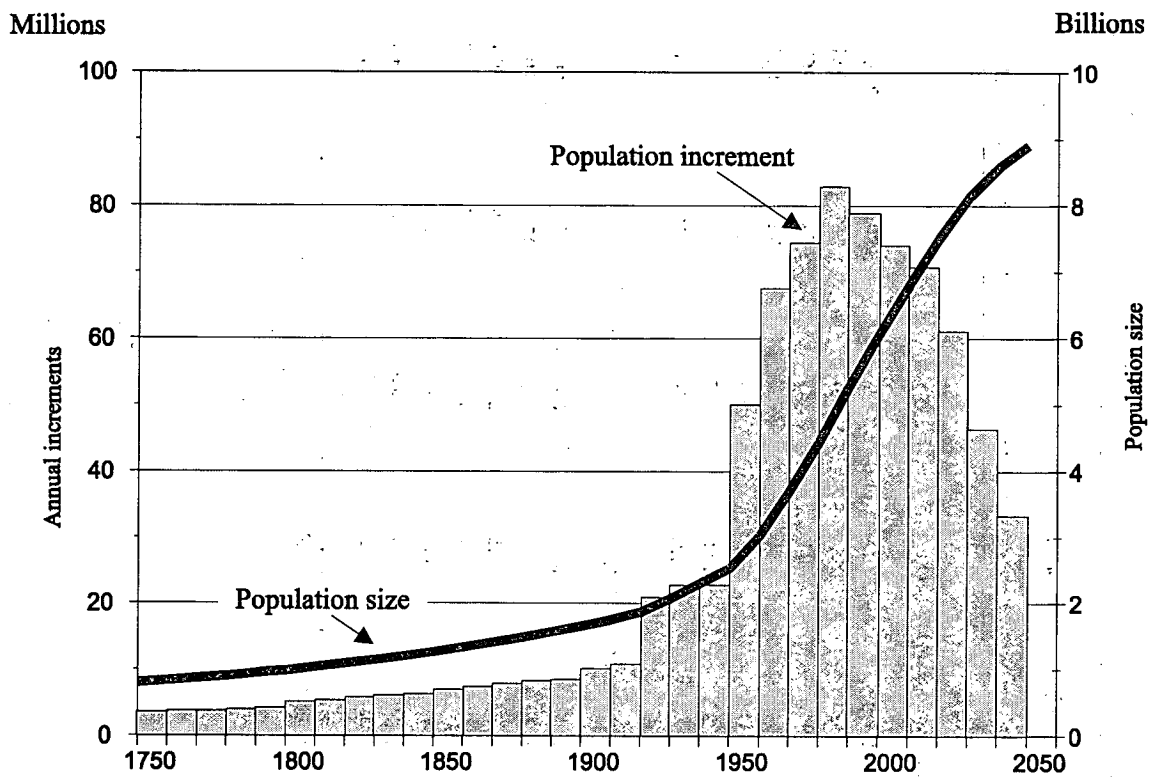
The medium-fertility variant assumes that fertility in countries with high fertility will ultimately reach replacement level (an average of about 2.1 children per woman in low-mortality settings), while in countries where current fertility is below replacement, fertility will remain below replacement. In the high-fertility variant, world fertility is expected to fall at a slower pace than in the medium variant, levelling off at an average of 2.6 children per woman for countries which currently have high fertility levels, or

TABLE II.1. POPULATION, WORLD AND MAJOR AREAS, 1750-2050

Major area	*1750*	*1800*	*1850*	*1900*	*1950*	*1970*	*1998*	*2050*
				A. *Population size (millions)*				
World total	791	978	1 262	1 650	2 521	3 696	5 901	8 909
Africa	106	107	111	133	221	357	749	1 766
Asia	502	635	809	947	1 402	2 147	3 585	5 268
Europe	163	203	276	408	547	656	729	628
Latin America and the Caribbean	16	24	38	74	167	285	504	809
Northern America	2	7	26	82	172	232	305	392
Oceania	2	2	2	6	13	19	30	46
				B. *Distribution (percentage)*				
World total	100	100	100	100	100	100	100	100
Africa	13.4	10.9	8.8	8.1	8.8	9.7	12.7	19.8
Asia	63.5	64.9	64.1	57.4	55.6	58.1	60.8	59.1
Europe	20.6	20.8	21.9	24.7	21.7	17.8	12.4	7.0
Latin America and the Caribbean	2.0	2.5	3.0	4.5	6.6	7.7	8.5	9.1
Northern America	0.3	0.7	2.1	5.0	6.8	6.3	5.2	4.4
Oceania	0.3	0.2	0.2	0.4	0.5	0.5	0.5	0.5

Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).

Figure II.1. Long-term world population growth, 1750-2050



Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).

at 0.4 more children per woman than in the medium variant for countries currently below replacement level. In the low-fertility variant, fertility is projected to decrease faster than in the medium variant: fertility is assumed to level off at 1.6 children per women for those countries that currently exhibit higher than replacement fertility, or 0.4 fewer children per woman than in the medium variant for countries currently below replacement.

Table II.2 and figure II.2 present the results of the world population projections for all three variants. In the medium-fertility variant, the total world population will grow to 8.9 billion people in 2050, a 51 per cent increase from its 1998 level. During the same period, annual population growth rates will be declining from 1.3 per cent in 1995-2000 to 0.3 per cent in the period 2045-2050 (figure II.3). Annual increments to the world population will continue to fall, first at moderate speed to 69 million between 2015-2020, and then will decline significantly afterwards, to 30 million between 2045 and 2050, less than half the current level. The medium-variant projection shows that the 6 billion mark will be passed shortly before the end of the millennium in 1999, and world population will reach 7 billion in 2013 and 8 billion in 2028, and will stay below 9 billion until the end of the projection horizon in 2050.

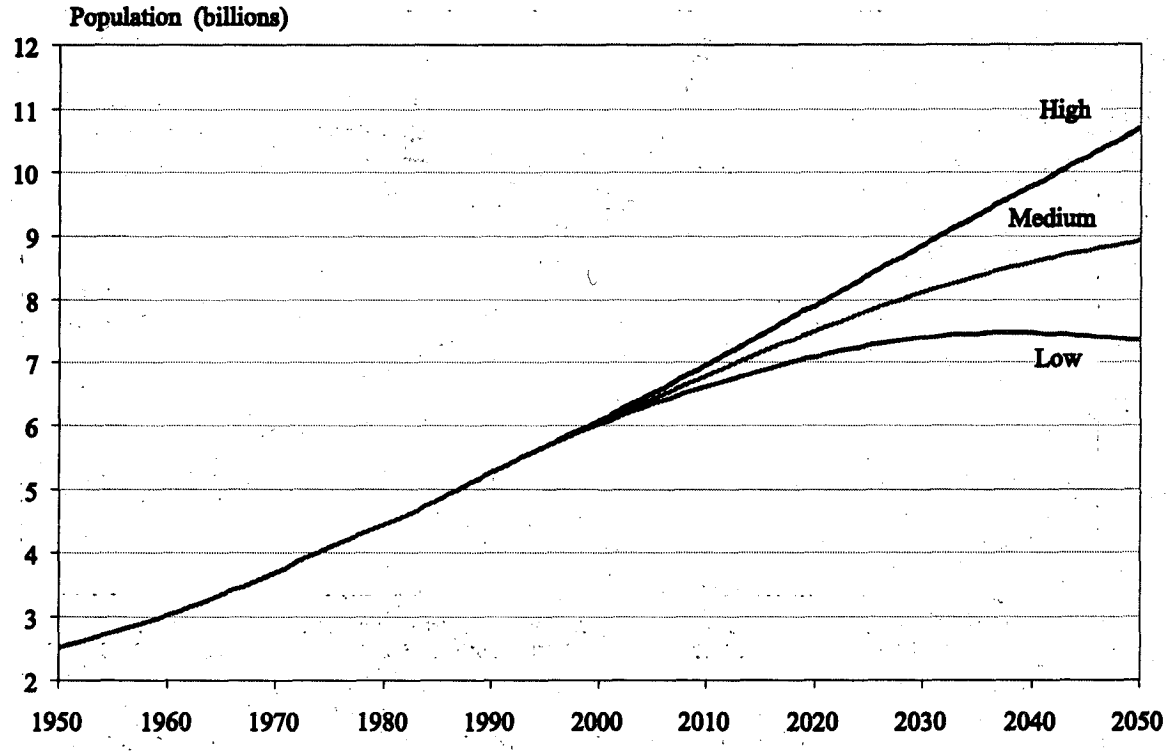
TABLE II.2. WORLD POPULATION ESTIMATES, 1950, 1970 AND 1998; PROJECTIONS BY VARIANTS, 2015-2050
(*Millions*)

Year	*Population*		
1950	2 521		
1970	3 696		
1998	5 901		
	High	*Medium*	*Low*
2015	7 430	7 154	6 872
2025	8 379	7 824	7 275
2050	10 674	8 909	7 343

Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).

The high-fertility variant, with fertility levels staying above replacement levels, shows that a relatively small difference in the ultimate fertility level of about half a child per woman above replacement would lead to a world population of about 10.7 billion people for the year 2050. This is about 1.8 billion more (20 per cent) than is pro-

Figure II.2. World population size: past estimates and medium-, high- and low-fertility variants, 1950-2050



Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).

jected in the medium-fertility variant. While the annual population growth rate is expected to fall from 1.3 per cent annually in 1995-2000 to about 0.9 per cent in 2045-2050, annual increments to the world population would increase from 83 million in 1995-2000 to 95 million in 2020-2025 before decreasing to about 91 million between 2045 and 2050.

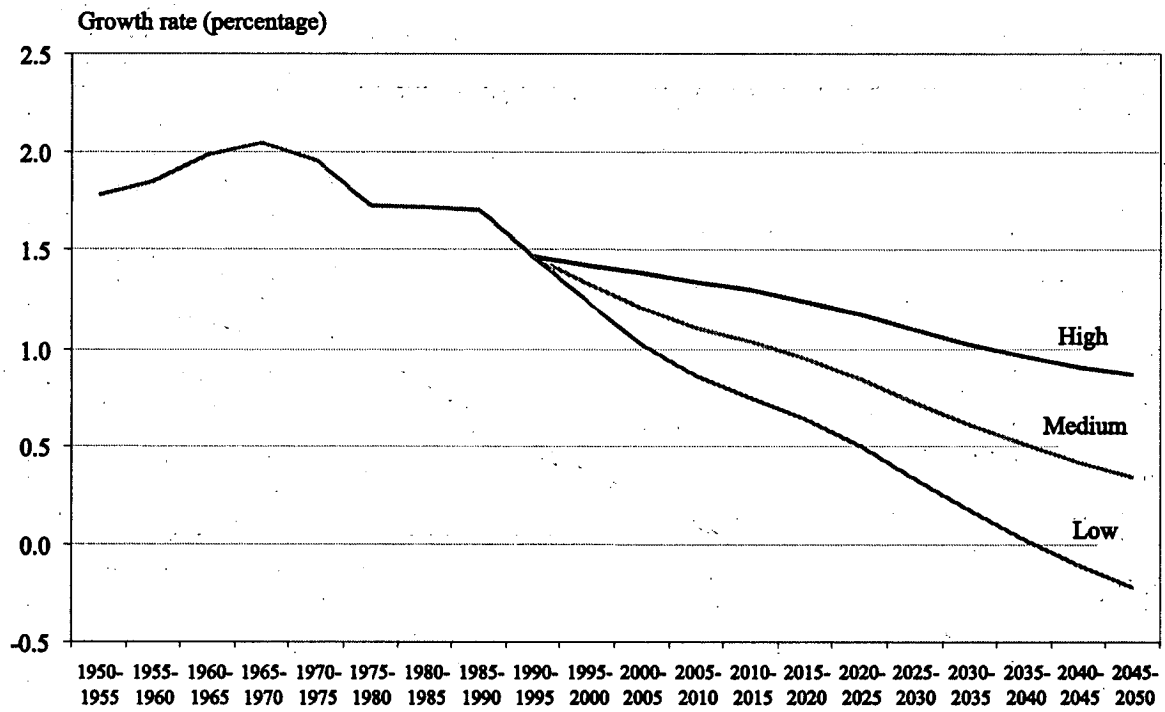
In the low-fertility variant, the world population will continue to grow to 7.5 billion people in 2040, and then decline to 7.3 billion in 2050, still a 25 per cent increase since 1998; but it will be about 1.6 billion people fewer than is projected for the medium-fertility variant. Average annual growth rates are projected to decline significantly to -0.2 per cent between 2045 and 2050. Annual increments to the world population will fall substantially, from 72 million in 1995-2000 to about 1.5 million between 2035 and 2040, and turn negative afterwards. In other words, the low-fertility variant implies that after 2040, the world population will decrease for the first time in history.

2. *Less developed and more developed regions*

In 1998, four out of five people in the world (4.7 billion) lived in the less developed regions, while 20 per cent (1.2 billion) lived in the more developed regions. The contribution of the more and less developed regions to the growth of the world's population differed widely, reflecting the different position these regions have, on average, in the demographic transition: during 1997, about 96 per cent (74 million) of the total annual population increase originated in the less developed regions of the world; the more developed regions added about 3 million.

The population of the less developed regions grew, between 1970 and 1998, from 2.7 billion to 4.7 billion people, an increase of 76 per cent. In the medium-fertility variant, the population of the less developed regions is projected to increase by another 64 per cent, to 7.8 billion people, by 2050. The 1970s marked a significant turning point in the evolution of demographic growth patterns: before 1970 (between 1950 and 1970), population growth rates accelerated, peaking at 2.5 per cent per year between

Figure II.3. World population growth rates: past estimates and medium-, high- and low-fertility variants, 1950-2050



Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).

1965 and 1970. Since then, the population growth rate of the less developed regions has been falling; it is expected to be 1.6 per cent between 1995 and 2000, and is projected to fall further to 0.4 per cent by the end of the projection horizon (2045-2050). Average annual population increments exhibited a similar, but lagged, trend. The highest annual increment has been estimated for the second half of the 1980s at 79 million people, up from about 68 million between 1970 and 1975. Thus, there was a time lag of about two decades between the highest population growth rate and the largest population increment. Annual population increments are projected to be at 75 million between 1995 and 2000, and then to fall to 34 million at the end of the projection period (2045-2050).

More developed regions exhibited, since 1970, a combination of almost constantly falling growth rates and still increasing population size. Between 1970 and 1998, the population of the more developed regions increased from 1.0 billion to about 1.2 billion, or by 17 per cent. Growth rates fell between 1970-1975 and 1995-2000 from 0.8 per cent to 0.3 per cent. For the projection period, growth rates are expected to decline further, becoming negative after 2020 and arriving at -0.3 per cent at the end of the projection horizon (in the medium-fertility variant). In the medium-fertility variant, the population size of the more developed regions in 2050 is projected to be 1.2 billion people, the size it had in 1992.

As a result of the marked differences in growth patterns between more developed and less developed regions (table II.3), the proportion of people living in the more and the less developed regions has changed and will continue to change significantly. While in 1970 more than one out of four persons in the world was living in the more developed regions (27 per cent), this has changed to one out of five (20 per cent) in 1998. In the future, the proportion of people living in more developed regions will continue to fall; in the medium-fertility variant it is projected that in 2050, 13 per cent of the world population will reside in regions that are currently classified as more developed.

TABLE II.3. POPULATION SIZE FOR THE MORE DEVELOPED AND LESS DEVELOPED REGIONS AND LEAST DEVELOPED COUNTRIES: ESTIMATES FOR 1950, 1970 AND 1998, AND MEDIUM-FERTILITY-VARIANT PROJECTION FOR 2050

	1950	*1970*	*1998*	*2050*
More developed regions	813	1 008	1 182	1 155
Less developed regions	1 709	2 688	4 719	7 754
Least developed countries	197	308	615	1 495

Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).

3. *Population growth among the major areas and regions*

Population distribution and population growth differ markedly among the major areas, past and present. Asia, Africa, and Latin America and the Caribbean all increased their share of the world population between 1970 and 1998. The Asian share of the world population rose from 58 per cent to 61 per cent, Africa from 10 per cent to 13 per cent and Latin America and the Caribbean from 8 per cent to 9 per cent (table II.1). During the same period, the share of Northern America declined from 6 per cent in 1950 to 5 per cent in 1998, and Europe fell from 18 per cent to 12 per cent.

Most major areas are currently exhibiting population growth rates well above 1 per cent: Africa is growing annually by 2.4 per cent, followed by Latin America and the Caribbean (1.6 per cent), Asia (1.4 per cent) and Oceania (1.3 per cent). Only Northern America, with 0.85 per cent, and Europe, with 0.03 per cent, exhibit growth under 1 per cent per year. Accordingly, and in combination with their current population size, each major area's contribution to the global population growth differs widely. The most populous and the fastest-growing major areas are the main contributors to world population growth: of the 78 million persons added each year to the world population during 1995-2000, 63 per cent (49 million) are from Asia and 23 per cent (17 million) from Africa. Latin America and the Caribbean adds currently less than 8 million people to world population growth (about 10 per cent of the total increment), followed by Northern America, with 2.6 million, or 3 per cent of the global increase. Oceania's contribution (about 381,000) and Europe's (about 195,000) are very small.

Africa was the fastest-growing region between 1970 and 1998, growing 2.7 per cent annually. Its population grew from 357 million in 1970 to 748 million in 1998, and is now comparable in size to the number of people living in Europe (728 million). Africa is expected to remain the region with the highest population growth rate, with an average annual growth rate between 1998 and 2050 of 1.7 per cent (medium-fertility variant). As a consequence, the population of Africa is expected to double its 1998 size by 2035, and is projected to reach 1.78 billion by the year 2050, an overall increase of 136 per cent. Africa is thus the only major area that is projected to have more than twice its current population size in 2050; consequently, its share of the world population will increase to about 20 per cent in 2050, up from 10 per cent in 1970 and 13 per cent in 1998. Eastern Africa and Middle Africa are currently (1995-2000) experiencing rapid population growth between 2 and 2.7 per cent, respectively. Other regions of Africa exhibited somewhat lower growth rates, but even the region with the lowest growth, Southern Africa, still experiences an average annual growth rate of 1.6 per cent.

Latin America and the Caribbean has grown, on average, at 2.0 per cent per annum since 1970, increasing its population from 284 million in 1970 to 504 million in 1998. With an average annual growth rate of 0.9 per cent between 1998 and 2050, Latin America and the Caribbean is projected to have slightly faster growth than Asia. Its population would grow to 809 million, an increase of 61 per cent. Growing at a rate slightly higher than the global average, its share of the world population will remain virtually unchanged at 9 per cent. Both Central America (1.9 per cent) and South America (1.5 per cent) are currently growing faster than the world average. The region of the Caribbean, with its many small island countries and areas, exhibits a growth rate of 1.1 per cent.

Asia, the most populous major area, exhibited a high growth rate of 1.8 per cent per annum between 1970 and 1998, increasing its population from 2.1 billion to 3.6 billion people. Between 1998 and 2050, Asia is expected to grow, at 0.7 per cent per year, at a significantly slower rate than in the past. Yet, by the year 2050, this major area will still have increased its 1998 population size by almost 1.7 billion people, or by 47 per cent. Its 2050 population of 5.3 billion people will then constitute 59 per cent of the world population. All regions in Asia, except for Eastern Asia, are currently (1995-2000) exhibiting growth rates above the world average. Western Asia, at 2.2 per cent per annum, has the highest growth rate, followed by South-central Asia (1.8 per cent) and South-eastern Asia (1.5 per cent). On the other side, Eastern Asia is estimated to have an average annual growth of just 0.85 per cent between 1995 and 2000. This growth rate is comparable to that of Northern America, and even lower than the region of Australia/New Zealand.

Oceania, the smallest major area, has exhibited rates of population growth higher than Northern America and Europe. Between 1970 and 1998, its total population grew from 19 million to 30 million, or by 54 per cent. In the future, it is projected that its current growth rate of 1.3 per cent will fall to about 0.5 per cent per year. As a result, its population is expected to reach 46 million by 2050.

Northern America, mainly comprising Canada and the United States of America, has experienced moderate but sustained population growth. Between 1970 and 1998, its total population increased from 232 million to 305 million people, thus adding 73 million people. It is projected that its population will reach 392 million in 2050, an increase of 29 per cent.

Europe had the lowest growth rate (0.4 per cent) per annum during the period 1970-1998, increasing its total population size from 656 million in 1970 to 729 million in 1998. It is the only major area that is projected to decline in population size (in the medium variant) over the projection period. With an average annual growth rate of -0.3 per cent between 1998 and 2050, its total population would be 628 million in 2050, thus returning to its 1963 population size. Europe's share of the world population will then have further declined, from 18 per cent in 1970 and 12 per cent in 1998 to 7 per cent in 2050.

Among the regions of Europe, Eastern Europe already exhibits negative population growth. In the period 1995-2000, the population size of this region is estimated

to decline even faster than it did during the first half of the 1990s, falling by 0.2 per cent per year. This is due to sharp fertility declines and rising or stagnant mortality for a number of Eastern European countries. All other regions within Europe are experiencing population growth, with Western Europe growing at 0.3 per cent, Northern Europe at slightly less than 0.2 per cent and Southern Europe at 0.1 per cent. Population increases in these regions, however, have been mainly due to migration gains. However, according to the medium-fertility variant projections, by 2045-2050, all European regions are projected to be declining, with the fastest population decline in Southern Europe (-0.8 per cent per year) and the slowest in Northern Europe (-0.3 per cent per year).

4. *Population growth for selected countries*

The United Nations prepares population estimates and projections for a total of 228 countries and areas. In 1998, 10 countries had a population of 100 million or more, accounting for 60 per cent of the total world population (table II.4). Most of the very populous countries are to be found in Asia, including the two largest—China (1.26 billion) and India (982 million), which together total 38 per cent of the global population. China and India are followed by the United States of America (274 million), Indonesia (206 million), Brazil (166 million), Pakistan (148 million), the Russian Federation (147 million), Japan (126 million), Bangladesh (125) and Nigeria (106 million). There are 13 countries with a population size between 50 million and 100 million, accounting for 870 million of the world population in 1998, or about 15 per cent of the world population. Another 25 countries, representing 13 per cent of the world population, have populations between 20 million and 50 million people. Most of the countries in the world, however, have relatively moderate population sizes. Of 228 countries or areas, nearly half (104) had a population size between 1 million and 20 million in 1998, and 76 had a population size of less than 1 million, but these 180 countries accounted altogether for less than one eighth of the world population (736 million).

Annual population growth rates currently differ widely among countries, from negative growth among some Eastern European countries to very high growth rates among some Asian and African countries. Altogether, there are 24 countries, comprising 1.7 per cent of the world population, which exhibit average annual growth rates of 3.0 per cent or higher (table II.5). On the other side of the spectrum, 24 countries, with 6.1 per cent of the global population, are exhibiting declining populations due to negative growth rates. The majority of people (about 4 billion people, or 68 per cent of the global population), however, are currently living in the 88 countries that exhibit growth rates between 0.5 and 2 per cent annually.

By the year 2050, the ranking of countries according to their population size will have changed significantly. In the medium-fertility variant, India is projected to be the largest country in the world, with a population of 1.5 billion; it will then be slightly larger than China. The United States of America will be the third largest country, with 349 million people, followed by Pakistan, with 345 million persons, and Indonesia, with 312 million people in 2050.

Between 1970 and 1998, only 9 out of 228 countries or areas, most of them very small in population size, exhibited population losses. Noticeable decreases in population size were recorded only for Hungary (-222,000 people) and Bulgaria (-104,000). All other countries experienced sustained population growth. The largest absolute increase occurred for Asian countries: China grew by 425 million, India by 427 million, Indonesia by 86 million and Pakistan by 82 million. The largest absolute population increases outside Asia occurred in Brazil (70 million) and the United States of America (64 million).

TABLE II.4. DISTRIBUTION OF COUNTRIES ACCORDING TO POPULATION SIZE, BY MAJOR AREA, 1998

Population size (millions)	*Africa*	*Asia*	*Europe*	*Latin America and the Caribbean*	*Northern America*	*Oceania*	*World total*	*Percentage of world total*
				A. *Number of countries*				
100+	1	6	1	1	1	0	10	4.4
50-100	2	5	5	1	0	0	13	5.7
20-50	8	9	3	4	1	0	25	11.0
1-20	35	23	26	17	0	3	104	45.6
<1	10	7	12	23	3	21	76	33.3
Total	56	50	47	46	5	24	228	100.0
				B. *Population (millions)*				
100+	106	2 843	147	166	274	0	3 537	59.9
50-100	126	341	308	96	0	0	870	14.7
20-50	256	245	101	125	31	0	757	12.8
1-20	257	152	171	113	0	27	720	12.2
<1	4	4	2	4	0	3	17	0.3
Total	749	3 585	729	504	305	30	5 901	100.0

Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).

TABLE II.5. DISTRIBUTION OF COUNTRIES ACCORDING TO POPULATION GROWTH RATE, BY MAJOR AREA, 1995-2000

Growth rate (in per cent)	*Africa*	*Asia*	*Europe*	*Latin America and the Caribbean*	*Northern America*	*Oceania*	*World total*	*Percentage of world total*
				A. *Number of countries*				
3.5+	4	2	1	4	0	2	13	5.7
3.0-3.49	4	4	1	0	0	2	11	4.8
2.5-2.99	16	7	0	5	0	1	29	12.7
2.0-2.49	17	8	0	5	0	6	36	15.8
1.5-1.99	6	14	0	8	0	2	30	13.2
1.0-1.49	6	5	5	7	1	5	29	12.7
0.5-0.99	3	5	8	9	2	2	29	12.7
0.0-0.49	0	2	16	4	2	3	27	11.8
<0.0	0	3	16	4	0	1	24	10.5
Total	56	50	47	46	5	24	228	100.0
				B. *Population in 1998 (millions)*				
3.5+	22	18	0	0	0	0	41	0.7
3.0-3.49	24	31	4	0	0	0	59	1.0
2.5-2.99	169	214	0	27	0	0	410	6.9
2.0-2.49	345	141	0	41	0	5	533	9.0
1.5-1.99	119	1 376	0	193	0	0	1 688	28.6
1.0-1.49	61	261	1	218	31	23	595	10.1
0.5-0.99	8	1 385	26	12	274	0	1 707	28.9
0.0-0.49	0	134	364	12	0	0	510	8.6
<0.0	0	25	334	0	0	0	360	6.1
Total	749	3 585	729	504	305	30	5 901	100.0

Source: World Population Prospects: The 1998 Revision, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).

In the medium-fertility variant, there will be 44 countries with smaller populations in 2050 than in 1998, experiencing a combined loss of 127 million people. Seven countries will have a total reduction of 10 million or more by 2050: the Russian Federation (-26 million), Japan (-21 million), Italy (-16 million), Ukraine (-12 million), Spain (-9 million), Germany (-9 million), and Romania (-6 million). On the other side of the spectrum, China and India will continue to have the largest total population increases. India is projected to increase more than twice as much as China between 1996 and 2050 (547 million versus 222 million). Following, with increases of 100 million or higher, are Pakistan (197 million), Nigeria (138 million), the Democratic Republic of the Congo (110 million), Ethiopia (111 million) and Indonesia (106 million).

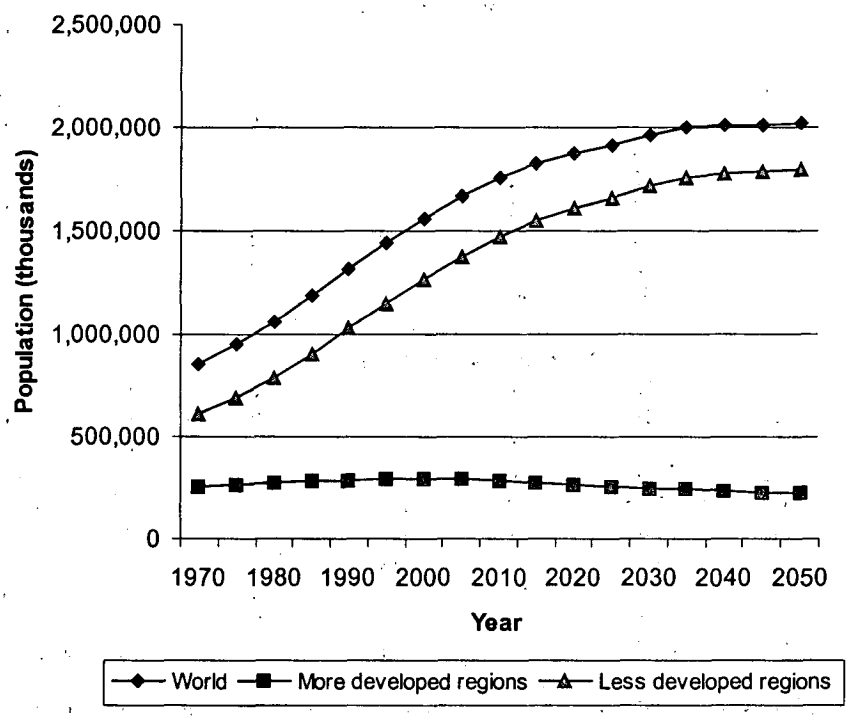
On a relative scale, there are 16 countries or areas that by 2050 will have increased their population size at least threefold. Among countries of 150,000 persons or more, the largest relative changes are expected for Oman and Yemen (multiplied by 3.5), Liberia (3.8 times the size of 1998) and Gaza Strip (multiplied by 4.6).

B. LEVELS AND TRENDS OF FERTILITY AND ITS DETERMINANTS

Over the past three decades, substantial declines in fertility have taken place in all areas of the world. Since 1970-1975 world total fertility has declined by 39 per cent: from 4.5 births per woman to the current level of 2.7. In the less developed regions women are currently having more than two fewer children than women did three decades ago. The average number of births per woman in the less developed regions declined by 45 per cent from 5.4 during 1970-1975 to 3.0 in 1995-2000. In the more developed regions, fertility declined from 2.1 births per woman during 1970-1975 to 1.6 for the current period, 1995-2000.

Even though fertility has declined to relatively moderate levels in many developing countries, and to below replacement level in some, a large number of live births are occurring annually, due to the continued growth in the number of women of childbearing age; a legacy of past higher fertility levels. As shown in figure II.4, the number of women between the ages of 15 and 49, who live in the less developed regions, has been growing since 1970 and is expected to continue growing at least until 2050. In these regions, the average number of births per year was 104 million in 1970-1975 compared to just 17 million in the more developed regions. While for the current period, 1995-2000, the number of live births in the more developed regions has decreased to 13 million annually, it has increased to 117 million per year in the less developed regions. Hence, the proportion of births taking place in the less developed regions increased from 86 per cent in 1970-1975 to 90 per cent during 1995-2000.

Figure II.4. Female population aged 15-49, for the world and the more and less developed regions, 1970-2050



Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).

The broad categorization of countries into the more and less developed regions conceals the large variation in levels of fertility among the major areas and regions. For the current period, 1995-2000, total fertility rates range from 1.4 and 1.9 births per woman in Europe and Northern America, respectively, to 5.1 in Africa. Rates for Asia and Latin America and the Caribbean fall in-between at 2.6 and 2.7 births per woman, respectively. During 1970-1975 both Asia and Latin America and the Caribbean had total fertility of around 5 births per woman and that for Africa was 6.6. At that time the gap in fertility levels between the former two areas (Asia and Latin America and the Caribbean) and Europe was more than two children. Declines in fertility in those two areas have narrowed the gap with Europe to a little over one child, but have increased the gap with Africa to about 2.5 children per woman.

Estimates of total fertility in 1970-1975 and 1995-2000 for countries with a population size above 150,000 in 1995 are available from the *1998 Revision* of the United Nations population estimates and projections. From those estimates, summarized in table II.6, three groups of countries can be discerned. First, are the high-fertility countries, that is, countries whose total fertility is above 6 children per woman. The second group, consisting of countries whose total fertility is below 6 but above 2.1 children per woman, can be deemed to be countries with moderate levels of fertility. The third group, which can be regarded as low-fertility countries, consists of countries whose fertility rate is below 2.1 children per woman.

In 1970-1975, 79 out of 184 countries were high-fertility countries. Of those countries, 44 were in Africa and 22 were in Asia. At that time all 16 low-fertility countries were in Europe and Northern America. By 1995-2000, the situation had changed considerably. The number of low-fertility countries has more than trebled to 58, of which 12 are in Asia, five in Latin America and the Caribbean and one in Africa. In some low-fertility countries, particularly those in Europe, fertility has dropped to unprecendentedly low levels. The number of countries with moderate fertility has increased from 89 during 1970-1975 to 107 in 1995-2000, while the number of high-fertility countries has decreased to 20. The latter are all in Africa and Asia: six in Western Africa, seven in Eastern Africa, four in Middle Africa, two in Western Asia and one in South-central Asia. It is evident, then, that most of the decline in fertility occurred in Asia, more than any other developing region.

TABLE II.6. DISTRIBUTION OF COUNTRIES ACCORDING TO LEVEL OF TOTAL FERTILITY RATE, BY MAJOR AREA, 1970-1975 AND 1995-2000

Total fertility rate	*Africa*	*Asia*	*Latin America and the Caribbean*	*Oceania*	*Europe and Northern America*	*Total*
			1970-1975			
6.0 and over	44	22	9	4	0	79
5.0-5.9	5	13	6	1	0	25
4.0-4.9	2	6	7	3	1	19
3.0-3.9	2	4	7	0	2	15
2.1-2.9	0	5	2	2	21	30
Less than 2.1	0	0	0	0	16	16
Total	53	50	31	10	40	184
			1995-2000			
6.0 and over	17	3	0	0	0	20
5.0-5.9	17	7	0	0	0	24
4.0-4.9	9	6	6	4	0	25
3.0-3.9	7	9	5	1	0	22
2.1-2.9	2	13	15	3	2	35
Less than 2.1	1	12	5	2	38	58
Total	53	50	31	10	40	184

Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).

The past three decades have seen the onset of the fertility transition in many developing countries. Using the criteria of average declines of more than 1 per cent per year from levels of above 6 children per woman in 1970-1975 and/or declines of more than 5 per cent over two consecutive five-year periods since 1970-1975, it appears that as many as 60 countries began their fertility transition after 1970-1975.[1] Fertility decline in those countries has been fast and apparently irreversible. Nearly half the countries (28 in all) that began their fertility transition are in Africa (nine in Eastern Africa, one in Middle Africa, six in Northern Africa, three in Southern Africa, and nine in Western Africa); 19 in Asia (eight in Western Asia, eight in South-central Asia, two in South-eastern Asia and one in Eastern Asia); and nine countries in Latin America and the Caribbean (three in South America and six in Central America).

Perhaps the most spectacular trend in fertility is shown by countries that had already started the transition by 1970 and had by 1995-2000 reached very low levels of fertility. In 1970-1975, 16 countries, comprising 16 per cent of the world's population, had fertility below 2.1 births per woman. By 1995-2000, the number has increased to 58 countries, with 44 per cent of the world's population living there. Even among countries with very low levels of fertility 30 years ago, the rates have continued to decline. In 22 countries of Europe and Northern America, the current fertility rate is 1.5 births per woman or below. Bulgaria, the Czech Republic, Italy, Romania and Spain have an average of just 1.2 births per woman in 1995-2000, while Estonia, Latvia, Germany, Greece, the Russian Federation and Slovenia have 1.3 births per woman. If such childbearing patterns continue in those countries, their populations will decline—as has already started to happen in countries of Eastern Europe.

Even though there is broad agreement about conditions that favour the onset of the fertility transition, there is no consensus regarding specific conditions that need to be present for the transition to begin. It is possible, however, to discern the commonalities among groups of countries, commonalities that are coherent with the theoretical perspectives on the factors associated with the onset and maintainance of fertility decline, such as socio-economic development, decline in mortality levels, female education, urbanization, and family planning programmes (Kirk, 1996; Mason, 1992).

Several commonalities are apparent. For instance, all but two of the 20 high-fertility countries in 1995-2000 are classified by the United Nations as least developed and most of them are less urbanized. In most of these countries infant and under-five mortality are still very high. In the 17 sub-Saharan African countries of the group, little or no change has occurred in levels of infant mortality since the 1970s and current levels are well over 100 deaths per 1,000 live births (United Nations, 1998a and 1999). The use of any type of contraception to limit or space births is less than 10 per cent in most of the 14 countries for which information is available (United Nations, 1996); gross secondary school enrolment ratios among females are below 10 in most of the 20 high-fertility countries (UNICEF, 1998); and the incidence of early marriage continues to be high in almost all current high-fertility countries (United Nations, 1990).

In countries where the fertility transition has been under way since 1970-1975, a significant increase in contraceptive prevalence was an important factor in fertility

decline. In Morocco, Tunisia and Algeria the percentage of married women using contraception ranges from 40 to 50 per cent, up from 20 to 30 per cent in the early 1980s. Significant increases in contraceptive prevalence were also evident in Botswana and Lesotho in Southern Africa, and Kenya and Zimbabwe in Eastern Africa (United Nations, 1996). In Asia, although data on contraceptive use are not available for all countries, the data for Bangladesh, the Islamic Republic of Iran, Jordan and Nepal indicate that increased contraceptive prevalence might have played a role in fertility decline. In Latin America and the Caribbean, where all the high-fertility countries in 1970-1975 experienced rapid declines in fertility, almost all the decline in fertility can be attributed to increased use of contraception (Chackiel and Schkolnik, 1997; United Nations, 1996).

The other commonality among countries in transition—that is, countries where the fertility transition has been under way since 1970-1975—include the decline in levels of child mortality since the 1970s, increased levels of education among women, and changing marriage patterns, particularly a rise in age at marriage. In Algeria, Botswana, Kenya, Lesotho, Morocco, Tunisia and Zimbabwe, strong declines in infant and under-five mortality have occurred since the 1970s (United Nations, 1998a). Education of women—as measured by the mean number of years of schooling completed among respondents in the Demographic and Health Surveys—is highest in Botswana, Kenya and Zimbabwe but, oddly, education of women in the Northern African countries of Egypt and Morocco is well below the levels for the former three countries. In Asia, recent rises in the age at marriage have been a major factor accounting for the rapid decline in fertility in the 15 countries that have initiated their fertility transition since 1970-1975. In Pakistan, for example, the percentage of 15- to 19-year-old women who were married was 73 per cent prior to 1970 but had decreased to 31 per cent for a more recent cohort of women aged 15-19. Similar though less dramatic declines in the proportions married among 15- to 19-year-old women were also seen in Kuwait, Nepal, Qatar, the Syrian Arab Republic and the United Arab Emirates (United Nations, 1990; United Arab Emirates, 1991; Qatar, 1991). On the other hand, changes in marriage patterns accounted for little of the fertility decline observed in Latin America and the Caribbean in the 1970s, 1980s and 1990s (Chackiel and Schkolnik, 1997).

Each of the commonalities identified above is not always autonomously conducive to fertility decline, nor are they always collectively associated with changes in fertility levels. For example, in Bangladesh, a least developed country, but with effective family planning activitites, fertility declined from 7.0 births per woman in 1970-1975 to just 3.1 in 1995-2000 despite slow economic and social progress (Cleland and others, 1994). On the other hand, several Arab countries in Western Asia, such as Jordan, Saudi Arabia and Oman, lead in indicators of economic wealth, but their fertility levels have shown little decline over the past 30 years. In addition, large variations in mortality levels can be found among countries with high fertility. In Jordan, Saudi Arabia (total fertility rates of 5.1 and 5.9, respectively) and Oman (total fertility rate of 7.2), infant mortality for the period 1995-2000 was 30, 23 and 25 deaths per 1,000 live births, respectively (United Nations, 1999).

In the post-transition countries, where fertility is increasingly becoming lower and old postulates of transition theory are becoming less pertinent, increasing attention is being paid to the determinants of post-transition fertility as more countries enter this phase. The increased status of women appears to be one of the important determinants of continued low fertility. There is some evidence, however, that several factors that have traditionally been negatively associated with fertility levels may now play an opposite role under modern conditions. For example, economic well-being and education have conventionally been negatively associated with fertility. Yet, recent trends in Sweden suggest the opposite (United Nations, 1998a). However, given the diversity of countries now in post-transition, research into the determinants of fertility in different low-fertility settings is clearly called for.

C. Levels and trends of mortality and its determinants

At the global level, the progress in the reduction of mortality achieved in the last quarter of the twentieth century was remarkable. This is revealed in the drop of the average level of infant mortality from 93 per 1,000 live births in 1970-1975 to 57 in 1995-2000 and the increase of life expectancy at birth from 58 years to 65 years, respectively. In 25 years, males gained 6.8 years of life expectancy and females 8.2 years; the average differential between the two genders widened from 2.9 to 4.4 years. The annual number of deaths rose from 45.4 to 52.3 million because of the continuing increase in the total population size of the world combined with population ageing. As a result, the world average crude death rate decreased to a lesser extent than most other mortality indicators: from 11.6 deaths per 1,000 population to 8.9.

The global mortality decline has been a striking achievement and the worldwide trend towards healthier, longer life is unmistakable (World Health Organization, 1998). However, premature deaths, defined here as deaths occurring before the age of 60 (equal to the life expectancy set as the universal target for the year 2000[2]), still outnumber the deaths in older ages by a proportion of 2:1.

The world average indicators are the result of very disparate mortality levels experienced by different regions and countries. For instance, all more developed countries and all but one country (Haiti) from Latin America and the Caribbean have achieved the year 2000 goal, but in 49 African and Asian countries, with a combined population of 604 million, life expectancy is still less than 60 years.

The Programme of Action adopted by the International Conference on Population and Development stipulates

that life expectancy at birth should universally exceed 70 years (65 years in countries with the highest levels of mortality) by the year 2005 (United Nations, 1995). The countries and regions of the world differ sharply with respect to their performance in reaching these goals.

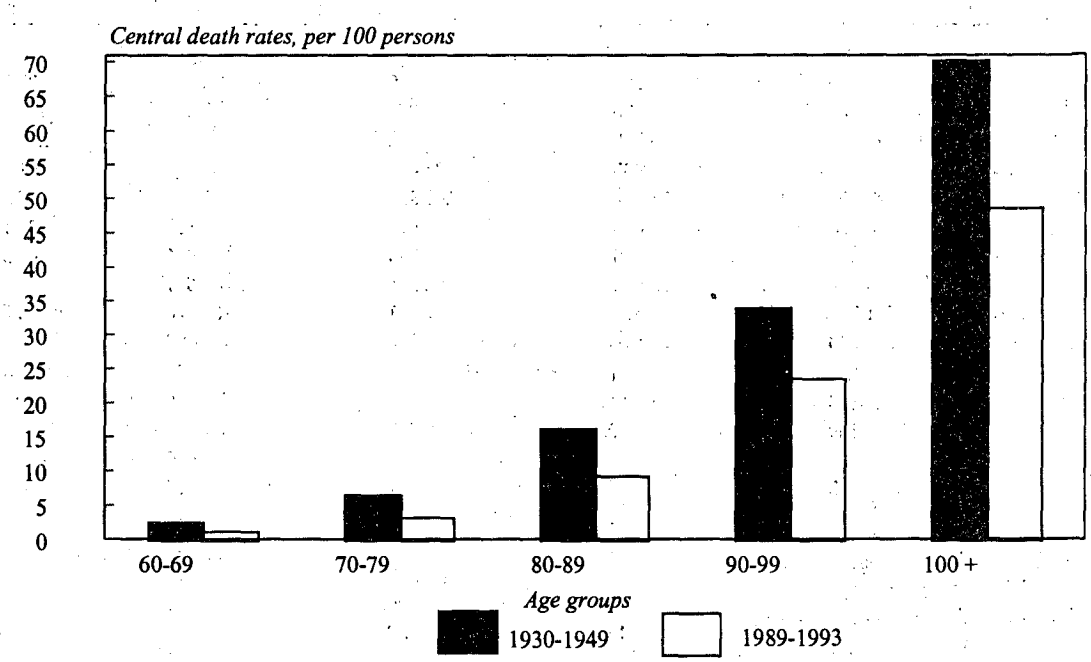
In 35 of 43 countries from the more developed regions with a population of 150,000 or more in 1995, life expectancy currently exceeds 70 years and in 24 of them it is higher than 75 years. In the first half of the twentieth century, mortality improvements were concentrated in childhood and the working ages, whereas mortality decreases at older ages were slow. Since 1950, and especially since 1970, the pace of mortality improvements at older ages has been accelerating in most developed countries with established market economies. For instance, female mortality rates for the four Northern European countries (Denmark, Finland, Norway and Sweden), shown in figure II.5, decreased from the 1930s-1940s to the late 1980s–early 1990s by more than 50 per cent for sexagenarians and septuagenarians, by more than 40 per cent for octogenarians and by more than 30 per cent for nonagenarians and centenarians (Vaupel, 1997). As a result, in developed market-economy countries, the number of persons surviving to very advanced ages had risen markedly.

Estimates for 1995-2000 show that, among the less developed regions, Latin America and the Caribbean as a whole has the highest life expectancy (69.2 years), having experienced an increase of 8.3 years since 1970-1975. From that major area, 20 countries have already reached the 2005 goal and six countries have a life expectancy of more than 75 years, similar to that of developed market-economy countries. However, life expectancy is lower than 70 years in a group of 10 Latin American and Caribbean countries, including Brazil, which is the most populous country of the area.

Mortality decline was also impressive in Eastern Asia and Western Asia, where the regional average life expectancies are currently 71.0 and 68.0 years, respectively. The progress was slower in South-eastern Asia (life expectancy of 65.7 years) and South-central Asia (62.3 years). However, some countries have much higher mortality levels than their neighbours; for instance, life expectancy is only 45.5 years in Afghanistan, 47.5 years in East Timor, and 53 years in Cambodia.

In Africa mortality is even higher, and the speed of improvements particularly slow. Only in Northern Africa did life expectancy increase considerably, and its current level of 64.8 years is higher than the 2000 goal. In the other four African regions life expectancy is substantially lower than 60 years: in Southern Africa by 5.6 years, in Middle Africa by 9.9 years, in Western Africa by 10.1 years, and in Eastern Africa by 14.6 years.

Figure II.5. Mortality rates at older ages for females in Denmark, Finland, Norway and Sweden combined, 1930-1949 and 1989-1993



Source: J. W. Vaupel, "Trajectories of mortality at advanced ages", in *Between Zeus and the Salmon: The Biodemography of Longevity*, K. W. Wachter and C. E. Finch, eds. (Washington, D.C., National Academy Press, 1997).

As a result of uneven mortality trends, international variations in life expectancy have become even more pronounced than they were a generation ago. In 1970-1975, the gap in life expectancy between the highest level of 74.4 years recorded in Norway and the lowest level of 38.0 years estimated for Afghanistan was 36.4 years or 96 per cent of the lowest level. By 1995-2000, the difference between Japan's life expectancy of 80.0 years and Sierra Leone's 37.2 years attained 42.8 years or 115 per cent of the lowest level.

Should the mortality assumptions of the *1998 Revision* of the United Nations population projections hold, by 2005 life expectancy would be 75 years or higher in 51 countries with a combined population of almost a billion people. At the same time, in 72 countries with a combined population of 2.7 billion (in 1998), life expectancy is expected to be lower than the goal of 70 years set by the International Conference on Population and Development. In 54 countries with a combined population of 870 million, life expectancy would not even reach the level of 65 years, and more than 10 per cent of the world's population would have a life expectancy of less than 60 years (table II.7). As illustrated in figure II.6, the number of countries where life expectancy is unlikely to attain the 2005 goals and the extent of the shortfall is greatest in Africa. Several countries from Asia and Latin America and the Caribbean are also not projected to achieve the goals. Even in Europe, an important fraction of the population is exposed to high risks of dying before age 70. While the lags with respect to the 2000 target are mainly among the least developed countries, all major areas of the world include countries where the progress will probably be insufficient to reach the goals set by the International Conference on Population and Development for the year 2005. Moreover, the evidence of the last decade shows that mortality improvements are not irreversible, irrespective of the achieved life expectancy.

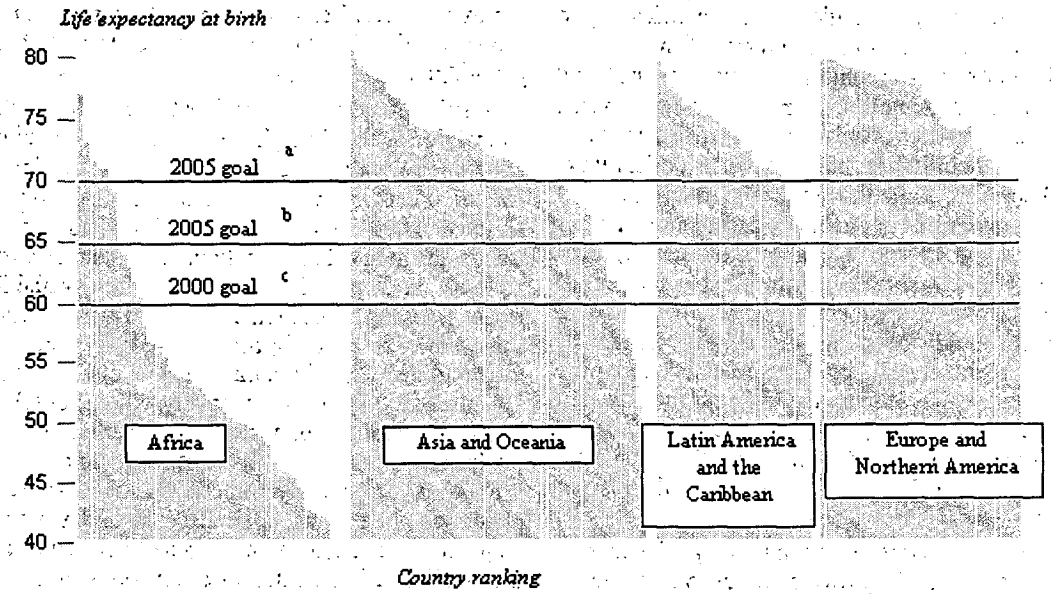
Mortality levels are relatively high in many countries with economies in transition. The European countries which belong to that group have experienced several quinquennia of stagnation, erratic changes and outright declines in national life expectancies (United Nations, 1998a and 1998c). In the Russian Federation, the mortality crisis of 1989-1994 resulted in an estimated 1.4-1.6 million additional deaths that would not have happened had the crisis not occurred (Bennett, Bloom and Ivanov, 1998). In the early to mid-1990s, increase in life expectancy resumed in the European transition-economy countries, gaining on average 0.5 years per calendar year. Yet, those improvements are not sufficient to achieve the 2005 life expectancy goal in three European transition-economy countries with a combined population of 162 million in 1998. In transition-economy countries from the Asian part of the former USSR, neither the current mortality levels nor projected changes point to the achievement of the Conference goals.

TABLE II.7. POPULATION ACCORDING TO PROJECTED LIFE EXPECTANCY IN 2005, BY MAJOR AREA, 1998

Life expectancy in 2005 (years)	*Less developed regions*			*More developed regions*	*World total*
	Africa	*Asia and Oceania*	*Latin America and the Caribbean*		
		(*Thousands*)			
<50	281 156	21 354	0	0	302 510
50-59	291 103	16 736	7 952	0	315 791
60-64	35 829	215 608	0	0	251 437
65-69	93 629	1 349 900	185 459	162 126	1 791 114
70-74	46 305	1 821 811	263 826	167 339	2 299 281
75-79	682	40 445	44 918	686 137	772 183
80+	0	0	389	165 995	166 384
Total	748 704	3 465 854	502 544	1 181 597	5 898 700
<70	701 717	1 603 598	193 411	162 126	2 660 852
<65	608 088	253 698	7 952	0	869 738
		(*Percentage*)			
<50	38	1	0	0	5
50-59	39	0	2	0	5
60-64	5	6	0	0	4
65-69	13	39	37	14	30
70-74	6	53	52	14	39
75-79	0	1	9	58	13
80+	0	0	0	14	3
Total	100	100	100	100	100
<70	94	46	39	14	44
<65	81	7	2	0	14

Source: World Population Prospects: The 1998 Revision, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).

Figure II.6. Life expectancy projected for 2005, by country ranking and region



Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).

[a]Life expectancy at birth greater than 70 years by 2005 is a universal goal agreed upon at the International Conference on Population and Development, 1994.

[b]Life expectancy at birth greater than 65 years by 2005 is a goal agreed upon at the International Conference on Population and Development, 1994, for countries with the highest level of mortality.

[c]Life expectancy at birth of not less than 60 years by 2000 is a universal goal reiterated at the World Summit for Social Development, 1995.

Recent years have shown a devastating toll from AIDS in a number of countries, particularly in sub-Saharan Africa. In many African countries, AIDS has increased infant and child mortality and reduced life expectancy at birth, threatening the economic and social development gains that were achieved during the past 30 years.

In 29 hard-hit African countries, life expectancy at birth is currently seven years less than would have been expected in the absence of AIDS. In the nine countries with an adult HIV prevalence of 10 per cent or more, life expectancy is, on average, 10 years less than it would have been. Yet, the demographic impact of HIV/AIDS is expected to intensify in the future. For example, by 2010-2015, these nine countries will lose 16 years of projected life expectancy to AIDS.

Botswana is the hardest-hit country: one of every four adults is infected by HIV. Life expectancy at birth has dropped from 61 years in 1990-1995 to 47 years in 1995-2000. Owing to the impact of AIDS, life expectancy is projected to further fall to 41 years by 2000 and 41 years in 2000-2005. In Zimbabwe, the second-hardest-hit country, one of every five adults is infected. Life expectancy at birth fell to 52 years in 1990-1995 and is projected to further decrease to 44 years in 1995-2000 and 41 years in 2000-2005. The South African epidemic began later than in Zimbabwe. One of every eight adults was infected by the virus in 1997. Owing to the later start, the demographic impact is yet to come. By 1990-1995, life expectancy at birth (estimated at 59 years) was barely affected by HIV/AIDS. However, projections show that by 2005-2010, life expectancy at birth will fall under 45 years.

During the last 25 years, countries and regions performed differently in improving child survival. The Programme of Action of the International Conference on Population and Development set a target for countries to achieve, by 2005, an under-five mortality rate below 60 deaths per 1,000 births. In the more developed regions, child survival has improved substantially, with under-five mortality rates more than halved since the early 1970s. In Latin America and the Caribbean and in South-eastern Asia, under-five mortality has also declined rapidly to levels which achieve or nearly achieve the 2005 target. Although in sub-Saharan Africa the reduction of under-five mortality in absolute terms is comparable with these areas, its level remains well above the goal set by the Conference. As a result, sub-Saharan Africa lags far behind other less developed regions.

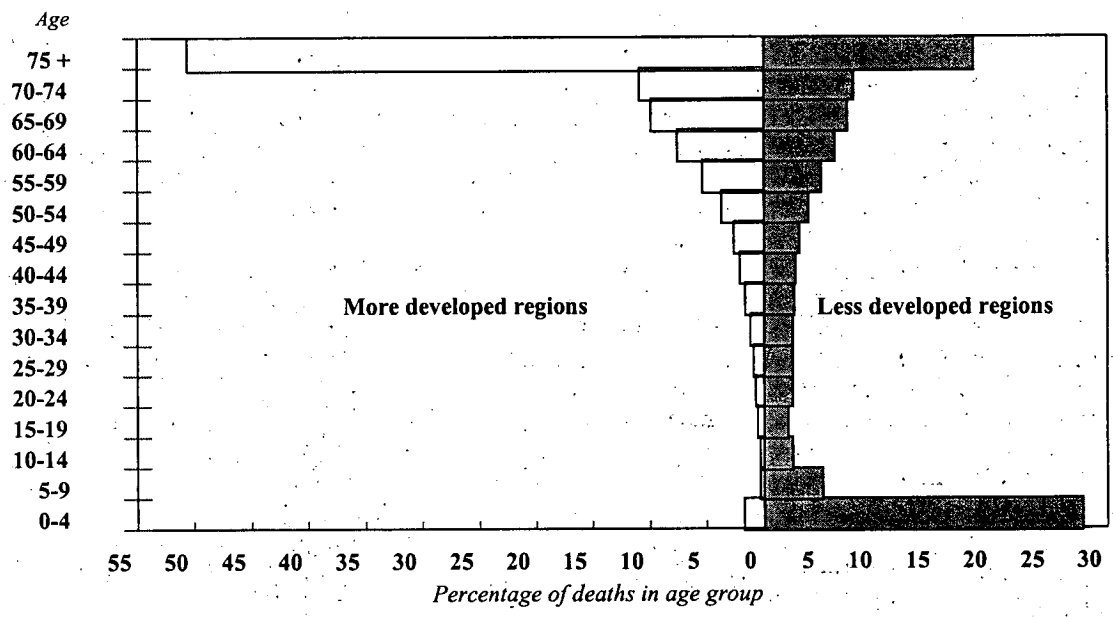
Large differences in the age structure of mortality remain between the more developed and less developed re-

gions, resulting in very different age distributions of deaths (figure II.7). From a period perspective, increasing life expectancy is associated with a changing age profile of deaths. As a result, the regions and countries of the world have become more diverse in terms of the share of infant and child deaths among all deaths. For instance, levels of life expectancy of 50 years and less, which still prevail in most countries of sub-Saharan Africa, are associated with a share of infant and child deaths typically exceeding 50 per cent, while the proportion of deaths at old ages does not exceed 10 per cent of all deaths. At life expectancy of around 65 years and above, further improvements in child survivorship have little effect on the overall mortality level, while the changes in health status and mortality in the middle of the age range (between ages 15 and 60), and of the elderly, play the crucial role. At the current life expectancy of more than 75 years achieved in several more developed regions (Australia/New Zealand, Northern Europe, Japan), under-five mortality constitutes less than 1 per cent of all deaths, whereas more than 70 per cent of all deaths occur at age 70 or above.

From a generational perspective, an average life expectancy of 50 years or less, implies that at least one quarter of newborns die before having children; and 30 per cent of those who survive to have children die before becoming grandparents. At life expectancy of 70 years or more, which is currently typical for most of the more developed and several developing countries, including China, the average newborn can expect to survive to see the birth not only of children and grandchildren but of great-grandchildren as well.

In spite of the persisting debate about the factors responsible for the first phase of mortality decline in the developed market-economy countries earlier in the twentieth century, the proximate causes of more recent national mortality trends are well understood. For instance, the medical interventions to combat or prevent infectious and parasitic diseases, the availability of insecticides to reduce their spread, and increased access to safe water and waste disposal were largely responsible for the rapid decreases in communicable diseases and ensuing mortality declines, especially among children, that many developing countries had experienced since the 1960s. However, the war against communicable diseases is not won yet. Globally, infectious and parasitic diseases, respiratory infections, malnutrition, and maternal and neonatal mortality account for more than 40 per cent of all deaths (World Health Organization, 1998) and their share in the estimated total number of years of life lost due to premature deaths is even higher (because these causes

Figure II.7. Age distribution of deaths for the more developed and less developed regions, 1995-2000



Source: World Population Prospects: The 1998 Revision, vol. II, *The Sex and Age Distribution of the World Populations* (United Nations publication, Sales No. E.99.XIII.8).

strike predominantly at younger ages), exceeding 50 per cent. Preventable causes of death largely predominate in the least developed countries. For instance, one quarter of the global number of years of life lost due to premature deaths is estimated to occur in sub-Saharan Africa and, of these, three quarters arise from preventable causes (Murray and Lopez, 1996).

Available data provide clear evidence of the decreasing mortality from cardiovascular diseases and neoplasms in the countries with developed market economies, which was made possible by advances in medical treatment and beneficial changes in lifestyles. The countries with economies in transition had been the beneficiaries of medical and other public health interventions that had reduced mortality due to communicable diseases—essentially of infants and children—to low levels (Ivanov, 1996). However, mortality due to noncommunicable diseases was stagnating or even slightly increasing there for decades and actually rose in several of them in the late 1980s and early 1990s, affecting primarily adults and especially middle-aged males (Barkalov and Ivanov, 1988). Noncommunicable diseases, including cardiovascular diseases and malignant neoplasms, account for 30 per cent of the global number of years of life lost due to premature deaths, considerably less than their proportionate share of mortality (which is higher than 50 per cent), reflecting the fact that these diseases claim lives among older adults (Murray and Lopez, 1996; World Health Organization, 1998).

Discerning the underlying causes of mortality trends is not as straightforward. The magnitude and the mechanisms of the environmental impacts, including air and water pollution, and nutrition are not sufficiently understood. Evidence is accumulating that certain types of behaviour, such as tobacco smoking and excessive intake of alcohol, saturated fat and sodium and insufficient physical exercise increase the risk of contracting cancer, cardiovascular diseases, cirrhosis of the liver and injuries.

The frequency of accidents and violent events leading to injury or death is increasing across world regions. About one in every 10 deaths worldwide is attributable to either a road traffic accident, occupational injury, homicide or suicide, which accounts for 15 per cent of the global number of years of life lost due to premature deaths (Murray and Lopez, 1996).

D. INTERNATIONAL MIGRATION AND ITS IMPACT ON POPULATION GROWTH

During the twentieth century, the contribution of net migration to population growth has been of minor importance for most countries of the world, especially for the numerous countries where natural increase has been high and where there has been no explicit or implicit policy favouring the inflow of international migrants. However, the marked reduction of fertility experienced by many countries over the past three decades has implied that the importance of international migration in determining population growth has been increasing. For developed countries in particular, the low levels of fertility that have prevailed over recent periods have meant that moderate or even low levels of international migration have had a significant impact on population growth. Furthermore, the increases in migrant inflows that some of those countries have experienced since 1985 have, in some cases, made major contributions to raise the rate of population growth, sometimes being responsible for preventing that rate from becoming negative. For these reasons, the role of international migration in determining levels of population growth deserves attention.

This section will present and discuss the best available estimates of net migration and its contribution to population growth over the 1970-1995 period for 164 countries or areas. Those estimates are a component of the official United Nations population estimates and projections produced by the United Nations Population Division every two years. The geographical units considered include as single units the former Ethiopia (including Eritrea), the former Czechoslovakia, the former Yugoslavia and the former Union of Soviet Socialist Republics (USSR) because the break-up of each of those States occurred late within the period under consideration and therefore, during most of that period, the major migration flows that those States experienced were internal rather than international. It must be noted that the estimates of net international migration for many of the countries considered are of uncertain accuracy. Indeed, since most countries of the world lack adequate statistics on international migration, net migration has to be estimated on the basis of partial information relative to international migration itself or in terms of the residual obtained once changes in total population size and natural increase have been estimated independently of one another. Nevertheless, the estimates presented here are the most comprehensive available and, as the analysis presented below will show, they reflect the general magnitude of the international migration phenomenon and are successful in capturing the major differences between countries.

According to *World Population Prospects: The 1998 Revision* (United Nations, 1999), the world's population increased by 1,970 million persons between 1970 and 1995. Most of that growth was absorbed by developing countries and countries with economies in transition, whose population rose by 1,845 million persons, whereas the Western market-economy countries as a whole absorbed the rest (125 million). Since net migration to Western market-economy countries from the rest of the world reached an estimated 35 million during the period, it accounted for 28 per cent of the population growth in those countries during 1970-1995, while it reduced the growth in the rest of the world by 1.9 per cent. When the contribution of net migration is compared to natural increase rather than to total population growth, the difference is amplified: net migration in the Western market-economy countries was equivalent to nearly 39 per cent of natural increase, whereas its magnitude represented only 1.8 per

cent of the natural increase occurring in the rest of the world. Although net migration rates between the two regions were also quite different—0.18 per cent for Western market-economy countries as against -0.04 per cent for the other countries—it is clear that net migration had a higher impact relative to natural increase than relative to overall population size, especially among Western market-economy countries. That is, whereas net migration was responsible for adding annually an average of one person for every 555 already present in the population of Western market-economy countries, it was equivalent to adding an extra person for approximately every three gained through natural increase. In the rest of the world, the reductions of population associated with net migration were small, whether measured in terms of the net emigration rate (one person for every 2,500 emigrated) or in relation to natural increase (there was barely one emigrant for every 50 persons gained through natural increase).

In measuring the impact of net migration on population growth at the country level, attention will be focused on the relation of net migration to natural increase by estimating the percentage by which net migration raises or reduces the value of natural increase to yield the rate of population growth. Because natural increase during 1970-1995 was positive for almost all countries or areas considered, the approach selected produces an unambiguous result in terms of sign: if net migration as a percentage of natural increase is positive, it contributes to raising population growth above natural increase, whereas if it is negative, net migration contributes to reducing population growth below natural increase. For reunified Germany, however, natural increase over the 1970-1995 period was itself negative at -0.11 per cent. That is, without a positive net migration, Germany would have experienced a reduction of its population during the period. For that reason, Germany is considered a special case in the analysis presented below.

Before focusing on the contribution of net migration to population growth, it is of interest to consider the general characteristics of the distribution of countries or areas according to various indicators of migration and natural increase. The five-number summaries of five key indicators are presented in table II.8. The five-number summary consists of the values of the lower extreme, lower quartile, median, upper quartile and upper extreme of a distribution. Those values divide the distribution into four consecutive intervals, each of which contains a quarter of the observations or, in this case, countries considered. The interquartile range (interval between the lower and upper quartile) contains the central half of the observations. Observations that differ from the median by more than twice the interquartile range are identified as statistical outliers according to the distribution being considered.

In terms of the net number of international migrants, the upper and lower quartiles of the distribution indicate that half of the countries or areas of the world experienced fairly small gains or losses of international migrants during the 25-year period considered, ranging between a gain of 201,000 persons and a loss of 368,000. Out of the 164 countries or areas considered, 90 experienced a net loss of population through international migration, eight had a net migration that was virtually zero and the other 66 experienced positive net migration. The latter group included 21 of the 24 Western market-economy countries and five of the six member States of the Gulf Cooperation Council (i.e., the oil-exporting countries of Western Asia). Table II.9 shows the countries that stand out as having particularly large net numbers of immigrants or emigrants according to the distribution of the net number of international migrants for the world as whole (that is, they are the outliers of the distribution). The list of main countries of emigration is headed by Mexico, which is estimated to have been the source of over 6 million emigrants during 1970-1995, almost all of whom went to the United States of America. The other countries qualifying as outliers because of the large negative net migration they experienced include: Afghanistan, Rwanda and Viet Nam, countries that have been the sources of very large numbers of refugees; and Bangladesh, Pakistan, the Philippines and Sri Lanka, which are known to be important sources

TABLE II.8. DISTRIBUTION OF COUNTRIES ACCORDING TO DIFFERENT INDICATORS OF INTERNATIONAL MIGRATION AND POPULATION GROWTH, 1970-1995

	Lower extreme	*Lower quartile*	*Median*	*Upper quartile*	*Upper extreme*
Net number of international migrants (thousands)	-6 027	-368	-13	201	16 665
Net migration rate (percentage)	-2.05	-0.26	-0.04	0.09	4.23
Rate of natural increase (percentage)	-0.11	1.27	2.31	2.69	3.60
Rate of population growth (percentage)	-0.04	1.07	2.17	2.68	6.53
Net migration rate as a percentage of the rate of natural increase	-277.1	-12.3	-1.9	6.1	1 030.0

Source: Calculated from *World Population, 1950-2050: The 1998 Revision* (POP/DB/WPP/Rev.1998/6), data set in digital form, 1998.

NOTE: The five-number summary consists of the values of the lower extreme, lower quartile, median, upper quartile and upper extreme of a distribution. Those values divide the distribution into four consecutive intervals, each of which contains a quarter of the observations or, in this case, countries considered. The interquartile range (interval between the lower and upper quartile) contains the central half of the observations.

of migrant workers for other countries of Asia as well as of settlers for the countries of immigration. Colombia, Egypt and Morocco have been major sources of workers directed, respectively, to Venezuela, Western Asia and Europe. Most of the countries that have experienced high net emigration also have large populations so that their net emigration rates tend to be low. The major exceptions are Afghanistan and Rwanda, which are estimated to have experienced net emigration rates of 1.0 per cent and 1.6 per cent, respectively.

TABLE II.9. COUNTRIES WITH A LARGE NET NUMBER OF INTERNATIONAL MIGRANTS DURING 1970-1995

	Net number of migrants (thousands)	*Net migration rate (percentage)*	*Rate of natural increase (percentage)*	*Net migration as percentage of natural increase*
Mexico	-6 027	-0.34	2.63	-12.9
Bangladesh	-5 175	-0.22	2.47	-9.1
Afghanistan	-4 092	-0.98	2.44	-40.4
Philippines	-3 494	-0.26	2.59	-10.2
Pakistan	-3 278	-0.13	2.92	-4.4
Viet Nam	-2 021	-0.14	2.28	-6.1
Rwanda	-1 750	-1.56	2.92	-53.4
Sri Lanka	-1 474	-0.39	1.81	-21.4
Morocco	-1 357	-0.26	2.33	-11.3
Egypt	-1 319	-0.11	2.32	-4.7
Colombia	-1 285	-0.17	2.26	-7.4
Uganda	-1 199	-0.33	2.87	-11.6
United Arab Emirates	1 286	4.23	2.31	183.3
Turkey	1 347	0.11	2.04	5.5
France	1 469	0.11	0.42	25.4
Australia	2 153	0.56	0.86	66.1
Canada	3 338	0.52	0.78	67.3
India	3 340	0.02	2.02	0.9
Saudi Arabia	3 371	1.12	3.05	36.9
Germany	6 184	0.31	-0.11	-277.1
United States of America	16 665	0.28	0.67	41.4

Source: Calculated from *World Population, 1950-2050: The 1998 Revision* (POP/DB/WPP/Rev.1998/6), data set in digital form, 1998.

NOTE: Countries listed are those whose net number of migrants differs from the median by more than twice the interquartile range (see table II.8).

At the other end of the distribution, the list of countries qualifying as statistical outliers because they received the largest net number of international migrants is headed by the United States of America, which is estimated to have gained nearly 16.7 million persons over the 1970-1995 period. The second most important receiving country is Germany, which recorded a net gain of 6.2 million persons, a significant proportion of whom have been the so-called "ethnic Germans", that is, persons of German origin who have the right to be admitted by Germany and are granted German citizenship soon after their admission. The other major receiving countries include Australia and Canada, two of the four traditional countries of immigration; France, a country that attracted temporary migrant workers until 1973 and then fostered their establishment by allowing family reunification; Saudi Arabia and the United Arab Emirates, countries that have actively imported migrant labour; and India and Turkey, which have been at the receiving end of important flows of refugees, asylum-seekers and persons who remain undocumented because they are not recognized as refugees. As in the case of the main countries of origin, it should be noted that, with the exception of Saudi Arabia and the United Arab Emirates, whose populations are small, the large net migration gains recorded by these countries produce only low to moderate net immigration rates. Even in the cases of Germany and the United States, the large net gains recorded result in net immigration rates of just about 0.3 per cent.

In terms of net migration rates, the five-number summary presented in table II.8 shows that, for at least half of the countries of the world, net migration has had a small effect. For countries in the central part of the distribution, net migration rates vary from a low of -0.3 per cent to a high of just 0.1 per cent. The distribution is so compact around its centre that statistical outliers appear at relatively moderate levels of net migration (see table II.10). At both the upper and the lower ends of the distribution, the countries that tend to experience statistically high rates of net emigration or immigration have small populations. Among the 26 countries listed in the table, 11 have populations under a million and a further nine had populations ranging from 1 million to 3 million persons in 1995. Only two countries had populations above 7 million: Afghanistan, with an estimated 20 million inhabitants in 1995, and Saudi Arabia, with about 18 million. Small countries or areas that have been known to foster the inflow of migrants, be it for settlement, as in the case of Israel, or for work, as in the case of Bahrain, Hong Kong Special Administrative Region of China, Macau, Qatar, Oman, Saudi Arabia and the United Arab Emirates, all appear as statistically exceptional because of the high net immigration rates that they have experienced. Countries with high levels of emigration include a few that have experienced major outflows of refugees or persons in need of protection, such as Afghanistan, El Salvador, Lebanon, Liberia and Rwanda, as well as small islands or countries that were still under colonial rule until fairly recently.

Turning now to the distribution of countries according to their rate of natural increase and rate of population growth (see table II.8), it is clear that both distributions are fairly similar except for the location of the upper extreme. With regard to natural increase, the highest rate experienced is 3.6 per cent per year whereas the highest rate of population growth recorded is nearly 80 per cent higher, at 6.5 per cent per year. This elongation of the upper end of the distribution indicates that net migration has a marked effect in increasing population growth among certain countries that are already experiencing high natural increase, such as those in Western Asia. To assess the exact impact of net migration on population growth, it is necessary to consider the distribution of net migration as a percentage of natural increase (see table II.8). According

TABLE II.10. COUNTRIES OR AREAS WITH VERY HIGH OR VERY LOW NET MIGRATION RATES DURING 1970-1995

	Net migration rate (percentage)	*Rate of natural increase (percentage)*	*Net migration as percentage of natural increase*	*Net number of migrants (thousands)*
Samoa	-2.05	2.65	-77.6	-80
Suriname	-1.71	2.08	-81.9	-167
Liberia	-1.56	3.18	-49.0	-677
Rwanda	-1.56	2.92	-53.4	-1 750
Guyana	-1.44	2.06	-69.6	-276
Lebanon	-1.26	2.05	-61.5	-862
Cape Verde	-1.13	2.54	-44.6	-92
Afghanistan	-0.98	2.44	-40.4	-4 092
Jamaica	-0.91	2.02	-45.0	-494
Fiji	-0.90	2.44	-37.0	-145
Belize	-0.83	2.99	-27.9	-35
Trinidad and Tobago	-0.76	1.81	-42.2	-213
El Salvador	-0.75	2.54	-29.6	-870
Oman	0.72	3.26	22.2	260
Israel	0.78	1.65	47.0	829
Macau	0.78	1.27	61.3	67
Hong Kong, China	0.79	1.01	77.8	999
Guinea-Bissau	0.84	1.94	43.5	170
Bahrain	0.89	2.59	34.4	87
Gambia	1.04	2.24	46.4	205
Saudi Arabia	1.12	3.05	36.9	3 371
Gabon	1.29	1.61	80.0	255
Western Sahara	1.92	2.31	83.2	78
Djibouti	2.54	2.29	110.9	238
Qatar	3.37	1.93	175.2	278
United Arab Emirates	4.23	2.31	183.3	1 286

Source: Derived from *World Population Prospects: The 1998 Revision*, data released in digital form.

NOTE: Countries listed are those whose net migration rate differs from the median by more than twice the interquartile range (see table II.8).

to the distribution in terms of that indicator, the range of variation is very wide, going from a low of -277 per cent to a high of 1,030 per cent. However, over the central part of the distribution, net migration at most serves to increase population growth by 6 per cent of natural increase or to reduce it by 12 per cent. That is, for half of the countries or areas in the world, the contribution of net migration to modifying natural increase is small. The relatively narrow range of variation at the centre of the distribution implies that countries qualify as statistical outliers when their levels of net migration have increased or decreased natural increase by modest amounts (see table II.11). At the upper end of the distribution, the countries that deserve special attention according to statistical criteria are those where net migration increases natural increase by at least a third, whereas at the lower end of the distribution those deserving attention should have their natural increase reduced by slightly more than two fifths by net migration. Although there are fewer countries where net migration increases population growth than countries in which it reduces such growth, there are more statistical outliers among the former than among the latter group of countries. Thus, 24 countries are exceptional in that the contribution of net migration to raising natural increase is on the high side, but just 15 appear as experiencing an important reduction of natural increase because of net migration. Furthermore, there are six cases in which net migration more than doubles the contribution made by natural increase, but only two in which net migration cancels out or more than cancels out natural increase (Bulgaria and Hungary) and in both of these cases the rate of natural increase is itself very low.

The countries where net migration contributes to population growth by a sizeable percentage of natural increase can be divided into two types: countries with relatively small populations and moderate to high rates of natural increase on the one hand and, on the other, countries with very low rates of natural increase. The first group includes countries or areas such as Djibouti, Gabon, Gambia, Guinea-Bissau, Hong Kong Special Administrative Region of China, Israel, Macau, Qatar, Singapore, the United Arab Emirates and Western Sahara. Among this group, countries or areas in Asia have favoured the inflow of migrants, especially of migrant workers. The second group includes mostly developed countries in Europe (i.e., Austria, Belgium, Denmark, Greece, Luxembourg, the Netherlands, Sweden and Switzerland) and most of the traditional countries of immigration (Australia, Canada and the United States). Whereas the last group of countries has actively favoured immigration, most European countries ceased favouring the inflow of migrants when labour migration was officially stopped in 1973-1974, but many of them have kept on receiving a modest inflow of migrants since then. Analysis of the data presented in table II.11 corroborates that, although the net migration rates that countries at the upper end of the distribution have been experiencing are generally fairly low, when compared with their low or even lower levels of natural increase, net migration makes a very sizeable contribution to population growth. For instance, in the case of Austria, the rate of natural increase during 1970-1995 was a low 0.02 per cent (in rounded figures), so that the net migration rate of 0.25 per cent was approximately 10 times or 1,030 per cent larger. Similarly, in Germany the net migration rate was almost three times the absolute size of the rate of natural increase during 1970-1995 and, because the latter was negative, the positive net migration was responsible for maintaining a positive rate of population growth during the period.

At the lower end of the distribution, net emigration tends to have a more moderate effect in reducing natural increase. However, except for Bulgaria and Hungary, all other countries at the lower end of the distribution would have had fairly high rates of population growth without emigration. They are countries with relatively small populations, including several small islands and a few countries or areas that are still or have until fairly recently been under colonial rule (e.g., Guyana, Martinique and Suriname), a factor that tends to facilitate emigration.

TABLE II.11. COUNTRIES OR AREAS WITH VERY HIGH OR VERY LOW LEVELS OF NET MIGRATION AS A PERCENTAGE OF NATURAL INCREASE DURING 1970-1995

	Net migration as percentage of natural increase	*Net migration rate (percentage)*	*Rate of natural increase (percentage)*	*Net number of migrants[1] (thousands)*
Germany	..	0.31	-0.11	6 184
Austria	1 030.0	0.25	0.02	486
Luxembourg	841.4	0.65	0.08	61
United Arab Emirates	183.3	4.23	2.31	1 286
Qatar	175.2	3.37	1.93	278
Sweden	117.7	0.19	0.17	409
Djibouti	110.9	2.54	2.29	238
Switzerland	87.5	0.27	0.31	446
Denmark	85.5	0.11	0.13	136
Western Sahara	83.2	1.92	2.31	78
Gabon	80.0	1.29	1.61	255
Greece	78.3	0.31	0.39	745
Hong Kong, China	77.8	0.79	1.01	999
Belgium	73.6	0.07	0.10	183
Canada	67.3	0.52	0.78	3 338
Australia	66.1	0.56	0.86	2 153
Macau	61.3	0.78	1.27	67
Singapore	50.1	0.62	1.23	416
Israel	47.0	0.78	1.65	829
Gambia	46.4	1.04	2.24	205
Guinea-Bissau	43.5	0.84	1.94	170
Netherlands	42.5	0.20	0.48	724
United States of America	41.4	0.28	0.67	16 665
Saudi Arabia	36.9	1.12	3.05	3 371
Uruguay	-40.2	-0.37	0.91	-276
Afghanistan	-40.4	-0.98	2.44	-4 092
Trinidad and Tobago	-42.2	-0.76	1.81	-213
Cape Verde	-44.6	-1.13	2.54	-92
Jamaica	-45.0	-0.91	2.02	-494
Martinique	-48.8	-0.58	1.18	-51
Liberia	-49.0	-1.56	3.18	-677
Rwanda	-53.4	-1.56	2.92	-1 750
Barbados	-53.4	-0.47	0.87	-29
Lebanon	-61.5	-1.26	2.05	-862
Guyana	-69.6	-1.44	2.06	-276
Samoa	-77.6	-2.05	2.65	-80
Suriname	-81.9	-1.71	2.08	-167
Bulgaria	-98.3	-0.26	0.27	-558
Hungary	-218.5	-0.08	0.04	-205

Source: Calculated from *World Population, 1950-2050: The 1998 Revision* (POP/DB/WPP/Rev.1998/6), data set in digital form, 1998.

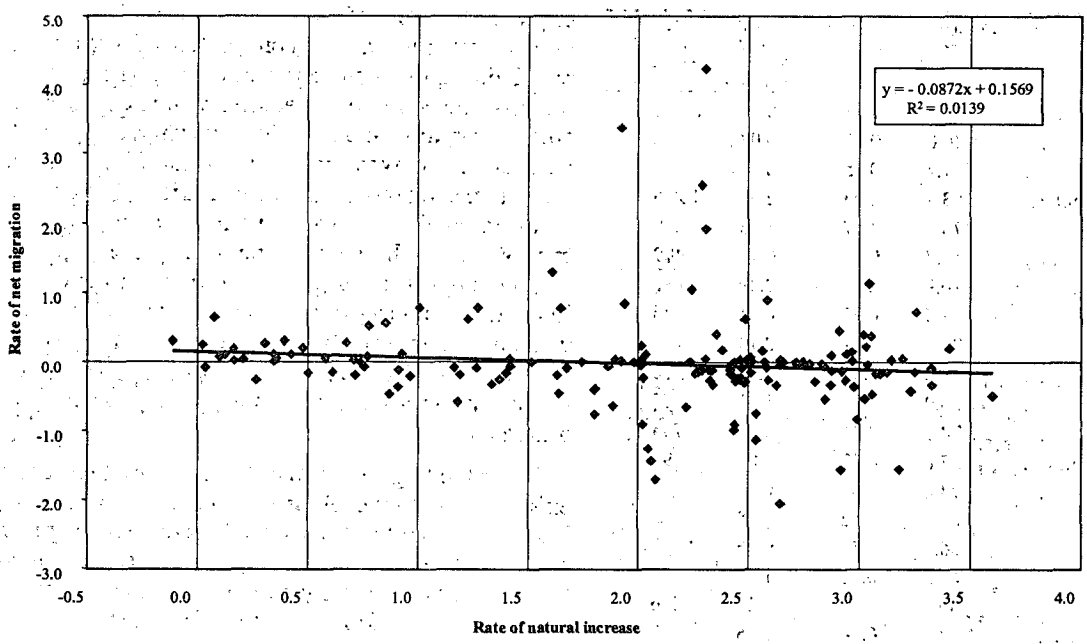
NOTE: Countries listed are those where net migration as a percentage of natural increase differs from the median by more than twice the interquartile range (see table II.8).

In summary, the evidence available indicates that, for 88 of the 164 countries or areas considered, the impact of international migration on population growth during the 1970-1995 period was small, with net international migration increasing or reducing the growth due to natural increase by at most 12 per cent. For a further 41 countries the contribution of net international migration to population growth was sizeable, with migration raising or decreasing natural increase by at least a third but, in most cases, by less than 100 per cent. Among these countries, only in a few cases did the contribution of net migration to population growth surpass that of natural increase. The fact that the countries where net migration made a sizeable contribution to population growth comprised a large number of the Western market-economy countries, including the main traditional countries of immigration, seems to validate the view that it is the developed countries of the North that are experiencing the major demographic effects of net immigration. However, it is important to underscore that there are almost as many developing countries or areas where, despite relatively high rates of natural increase, the impact that net migration has had in increasing population growth has been equally important.

Given the large economic and demographic disparities existing between developed and developing countries, it has been argued that migration from developing to developed countries will necessarily rise as developing countries become increasingly incapable of absorbing the large increases expected in the labour force (Emmerij, 1993; Golini, Righi and Bonifazi, 1993). Since such disparities have been very much in evidence during 1970-1995, it is instructive to consider whether the experience of the past in some way validates such expectations. One issue to be explored is whether emigration is likely to be higher from countries experiencing high levels of natural increase. Figure II.8 presents a scatter plot of the net migration rate plotted against the rate of natural increase, each estimated for the 1970-1995 period. The points representing countries appear to be fairly evenly distributed above and below the axis representing 0 net migration for almost every level of natural increase. Only at very low levels of natural increase (below 0.5 per cent) do countries seem more likely to experience a positive rather than a negative level of net migration. At high levels of natural increase (above 2 per cent), the countries experiencing net emigration seem to be somewhat more numerous than those experiencing net immigration, but the latter are fairly abundant and in several instances they experience high natural increase together with high net immigration. It seems, therefore, that there is no simple or unidirectional relation between natural increase and net migration. Thus, although a line fitted to the observations has a negative coefficient for natural increase, neither that coefficient nor the constant prove to be statistically significant. This means that, despite the fact that net migration has some tendency to decline and become negative as natural increase rises, that relation is very weak. Rapid population growth, per se, does not necessarily fuel emigration.

In conclusion, migration has always been an important process leading to the redistribution of population. At the beginning of the twentieth century, it was a major component of the population growth of the relatively sparsely populated countries of overseas European expansion. By

Figure II.8. Plot of countries according to rate of net migration and rate of natural increase, 1970-1995



Source: Calculated from *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).

the end of the century, international migration has become a key component of the population growth of most of the highly developed market-economy countries of Europe and has remained an important determinant of population growth in Northern America and Australia. From the perspective of a world divided into a developing "South" and a developed "North", international migration is often seen as the main process leading to the redistribution of population. When very low levels of natural increase are achieved and sustained, international migration can indeed play a role in affecting population growth, but it too would need to be sustained. Unless net migration increases exponentially, it cannot counterbalance over the long run the effects of either a positive or a negative rate of natural increase (Keyfitz, 1971; Espenshade, Bouvier and Arthur, 1982) and, at least during the twentieth century, no major region has experienced anything akin to an exponential growth in net migration over a prolonged period.

E. GOVERNMENT VIEWS AND POPULATION POLICIES

Continued high rates of population growth remain an issue of policy concern for many countries of the world. In 1998, about 40 per cent of the countries of the world (54 per cent of the developing countries) considered their rate of population growth to be too high. However, at the same time, in response to very low levels of fertility in some countries, particularly in the more developed regions, and the social and economic consequences of the resultant population ageing and the potential for population decline, more and more countries are expressing concern about low rates of population growth. Rapid demographic change, whether rapid population growth or rapid fertility decline, creates serious societal difficulties as countries respond to pressures for social and other support services.

The proportion of Governments that consider their rate of population growth to be too high increased from 28 per cent in 1974 to 44 per cent in 1993 (table II.12 and figure II.9). However, by 1998, this proportion had declined to 41 per cent. In contrast, the proportion of Governments perceiving their growth rate to be too low, which had fallen from 25 per cent in 1974 to 11 per cent in 1993, increased to 14 per cent in 1998.

These changes in Government views since 1993—with fewer countries expressing concern about high rates of population growth—correspond to the changing demographic situation in many countries. During the last decade, population growth has begun declining in many countries, in both relative and absolute terms. Also, during the last decade, in more and more countries, first in the developed countries and lately extending to some of the developing countries in Eastern and South-eastern Asia, couples are having, on average, fewer births than are necessary for generations to replace themselves. That is, more and more countries are experiencing below-replacement-level fertility.

TABLE II.12. GOVERNMENTS' VIEWS OF POPULATION GROWTH RATE, 1974-1998

(Percentage of countries)

Year	*Too high*	*Satisfactory*	*Too low*	*Total*	*Number of countries*
World					
1974 . . .	27.6	47.4	25.0	100.0	156
1983 . . .	36.3	45.2	18.5	100.0	168
1993 . . .	43.7	45.3	11.0	100.0	190
1998 . . .	41.1	44.4	14.5	100.0	180

Source: The Population Policy Data Bank maintained by the Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat.

Nevertheless, most developing countries, including much of Africa, Asia, Oceania and the Caribbean, express the view that their rates of population growth are too high (table II.13 and figure II.9). Countries which view population growth as satisfactory include most of the developed countries, as well as a majority of countries in South America, Eastern Asia and Middle Africa, and a few countries in Western Asia and other regions. Countries which view population growth as too low are primarily located in Eastern Europe and Western Asia, with a small number scattered in other regions. In 1998, the greatest shift in views with regard to population growth occurred among the countries of the former USSR and in Eastern Europe. Many of these countries considered their population growth to be satisfactory in 1993 but have since shifted to a view of considering it to be too low.

TABLE II.13. GOVERNMENTS' VIEWS OF POPULATION GROWTH RATE, BY LEVEL OF DEVELOPMENT, 1983-1998

(Percentage of countries)

Year	*Too high*	*Satisfactory*	*Too low*	*Total*	*Number of countries*
More developed regions					
1983 . . .	0.0	69.2	30.8	100.0	39
1993 . . .	1.8	85.7	12.5	100.0	56
1998 . . .	2.2	68.9	28.9	100.0	45
Less developed regions					
1983 . . .	47.3	38.0	14.7	100.0	129
1993 . . .	61.2	28.4	10.4	100.0	134
1998 . . .	54.1	36.3	9.6	100.0	135

Source: The Population Policy Data Bank maintained by the Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat.

During the past five years, new national population policies and programmes have been adopted in many countries such as Viet Nam (1993); Bangladesh, Malaysia, Turkey (1994); the Lao People's Democratic Republic (1995); the Republic of South Korea (1996); and El Salvador, Nicaragua and Sri Lanka (1997). Their main objectives are to ensure the achievement of sustainable growth and development. In addition, related laws have also been enacted, such as the Family Planning Law in the Islamic Republic of Iran and several laws on children and women in China.

Some Governments have identified quantitative targets in their development plans to reduce the population growth rate (Ghana, India, Indonesia, the Islamic Republic of Iran, Namibia, Pakistan, the Philippines and Turkey). In general, however, national programmes are shifting from such targets to help meet needs, improve access, and increase choices; they are shifting their emphasis from quantitative to qualitative issues, with the focus being on satisfying unmet needs and on a "people- and family-centred" approach.

The proportion of Governments that have policies aimed at influencing population growth increased from 45 per cent in 1974 to 63 per cent in 1993 (table II.14 and figure II.10). By 1998, this proportion had declined to 56 per cent. Seventy Governments (39 per cent) have policies aimed at lowering population growth, while only 18 (10 per cent) have policies aimed at increasing population growth.

TABLE II.14. GOVERNMENTS' POLICIES ON POPULATION GROWTH RATE, 1974-1998

(Percentage of countries)

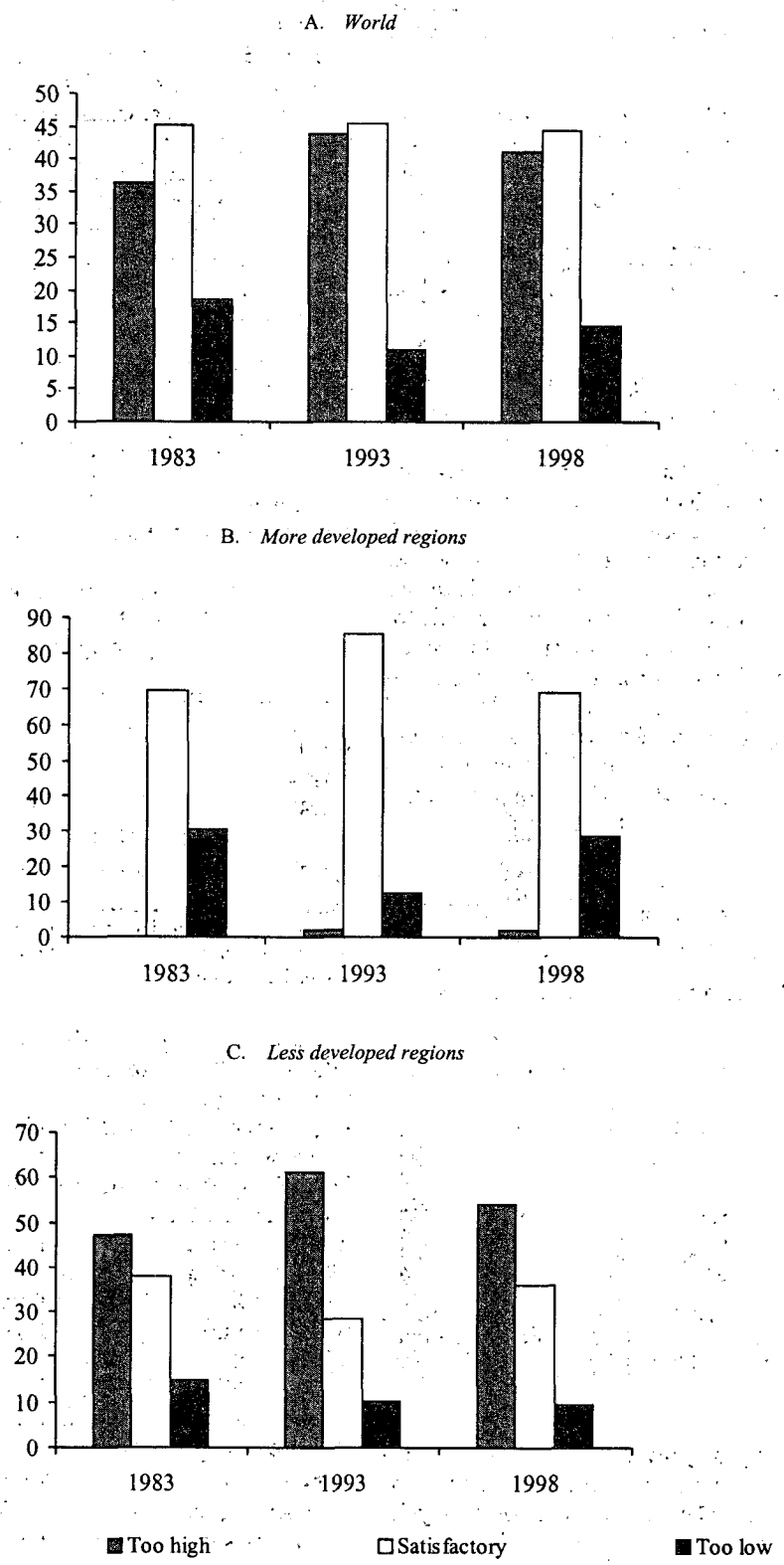
Year	*Lower*	*Maintain*	*Raise*	*No intervention*	*Total*	*Number of countries*
World						
1974 . . .	25.0	0.0	19.9	55.1	100.0	156
1983 . . .	25.6	13.5	19.0	41.9	100.0	168
1993 . . .	37.9	13.1	11.6	37.4	100.0	190
1998 . . .	38.9	7.8	10.0	43.3	100.0	180

Source: The Population Policy Data Bank maintained by the Population Division of the Department for Economic and Social Affairs of the United Nations Secretariat.

In developing countries, during the 15-year period 1983 to 1998, the proportion of Governments intervening to influence population growth increased from 58 per cent to 65 per cent (table II.15 and figure II.10). In 1998, there was a noticeable increase in the number of countries that had policies to maintain the current rate of growth versus a decrease in the number of countries that had policies aimed at increasing population growth, compared to 1993. The comparison of the developed countries that existed in 1983, 1993 and 1998 (which excludes countries that came into being after 1983) shows that the proportion of Governments intervening to influence population growth declined between 1983 and 1998 because a number of countries with policies to maintain or increase the rate of population growth shifted to a policy of non-intervention.

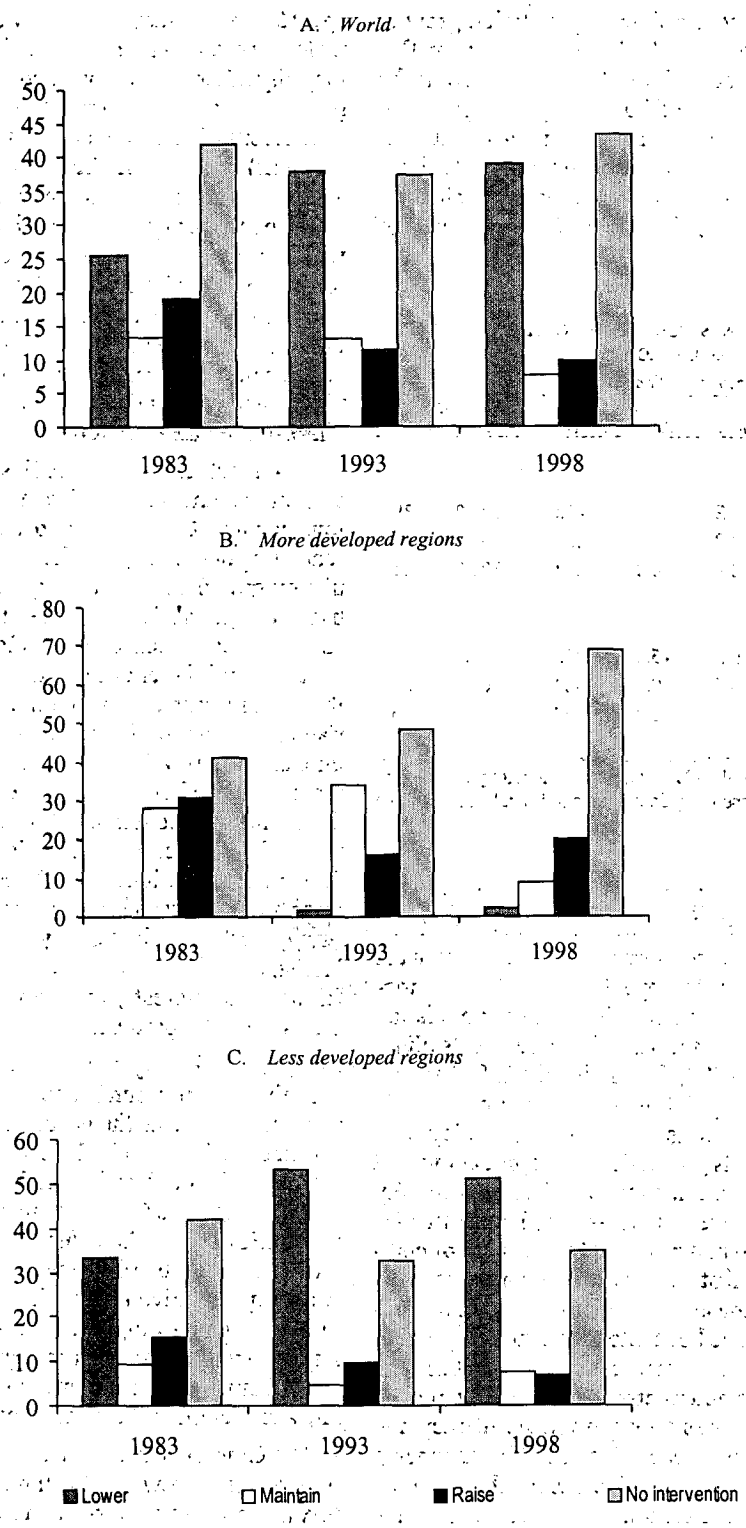
In Africa, the trend has been for an increasing number of countries to adopt population policies and intensify efforts to reduce population growth. The Government of Djibouti, which considered the growth rate to be satisfactory in 1993, perceived it as too high in 1998 and shifted

Figure II.9. Governments' views on population growth rate, 1983-1998
(*Percentage*)



Source: The Population Policy Data Bank maintained by the Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat.

Figure II.10. Governments' policies on population growth rate, 1983-1998
(Percentage)



Source: The Population Policy Data Bank maintained by the Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat.

from a policy of non-intervention to a policy of reducing population growth. Also, the Governments of Burkina Faso, Ethiopia and Niger changed their policy of non-intervention to a policy of reducing population growth. In contrast, the Government of Central African Republic, which earlier considered the growth rate to be too high, is now satisfied and has changed its policy of non-intervention to a policy of maintaining the current population growth rate. The Government of Guinea, while still considering its growth rate too high, changed its policy of reducing population growth to a policy of non-intervention.

TABLE II.15. GOVERNMENTS' POLICIES ON POPULATION GROWTH RATE, BY LEVEL OF DEVELOPMENT, 1983-1998

(Percentage of countries)

Year	*Lower*	*Maintain*	*Raise*	*No intervention*	*Total*	*Number of countries*
More developed regions						
1983 . . .	0.0	28.2	30.8	41.0	100.0	39
1993 . . .	1.8	33.9	16.1	48.2	100.0	56
1998 . . .	2.2	8.9	20.0	68.9	100.0	45
Less developed regions						
1983 . . .	33.3	9.3	15.5	41.9	100.0	129
1993 . . .	53.0	4.5	9.7	32.8	100.0	134
1998 . . .	51.1	7.4	6.7	34.8	100.0	135

Source: The Population Policy Data Bank maintained by the Population Division of the Department for Economic and Social Affairs of the United Nations Secretariat.

Likewise, in Asia, a significant number of countries still consider their population growth rates to be too high. Growth in India, the second most populous country in the world, will have a definite impact on the global demographic situation. A reduction in India's population growth rate is one of the priority objectives of its Ninth Five-Year Plan (1997-2002). Following the 1994 International Conference on Population and Development, India instituted a shift in terms of both the policy and programme content of its population and reproductive and child health programme. The practice of setting centrally determined contraceptive method–related performance targets has been ended and replaced by a system of community needs assessment to drive the programme. Formerly disparate contraceptive and maternal and child health interventions have been integrated into a reproductive and child health programme with an emphasis on meeting clients' needs and improving the quality of care. In view of the strong links between female literacy and fertility, female literacy is being increased by enhancing school enrolment of girls and decreasing the drop-out rate, and through programmes that promote non-formal education. The Government seeks to improve all-round health care for women, to give tax breaks to small families and to adopt incentives to improve the situation of the girl child.

The Government of Pakistan is seeking to accelerate the pace of fertility decline and to lower rates of population growth. About 41 per cent of the population is below age 15. The literacy rate is low, 27 per cent among females, and around 12 per cent in rural areas, where the majority of the population resides. The current population programme is designed to increase coverage of the population from 20 to 80 per cent (with special attention to rural areas) and to raise the contraceptive prevalence rate. The information, education and communication campaign of the programme has been strengthened in line with the Programme of Action of the International Conference on Population and Development, with the main emphasis being on safe motherhood; breastfeeding; promotion of birth spacing; status of women; maternal and child health; child nutrition; the relationship between population and environment; and education, with special emphasis on female education.

In contrast, all countries of Eastern Asia view their population growth rates as satisfactory, except the most populous country, China, which despite impressive results in reducing population growth has resumed viewing its population growth rate as too high. China's large population base and growth is said to be challenging its limited resources, socio-economic development, people's living standard and the environment. Other challenges include the migrant population, redundant workers, early marriage and premarital pregnancy and, in certain areas, the unbalanced sex ratio at birth and the reconciliation of people's increased need for reproductive health with the deepening of economic reform. Following the International Conference on Population and Development, the Government of China formulated the Maternal and Child Health Care Law and Programme for Women's Development, apart from the already existing Marriage Law, the Heritage Law and Law for the Protection of Women's Rights and Interests, for the improvement of women's status and their participation in social development.

The steep fertility decline in the Republic of Korea has brought about profound changes in the composition of the population, such as the decline in the school-age population and the increase in the aged population. Considering the current level of fertility and the consequences of population change, the Government announced its "New Population Policy" in 1996. Under the new policy the focus of the national family planning programme has been shifted from a quantitative to a qualitative approach. The future family planning programme is intended to focus on the improvement of programme quality and contraceptive-use effectiveness, the maintenance of a balanced sex ratio, and a reduction in the number of induced abortions.

The Government of Malaysia has shifted from a view of population growth as too high to a view of it as satisfactory and no longer intervenes to reduce the rate of population growth. This corresponds to the steady decline of the population growth rate that has resulted mainly from the decline in overall fertility, which may be attributable to such factors as higher educational levels of the popula-

tion, especially females; the increasing pace of urbanization and industrialization; delayed marriage and childbirth; and a general improvement in the standard of living. Women's advancement in Malaysia is evident in many sectors. Following the International Conference on Population and Development, Malaysia initiated changes in policies, programmes, and institutional and organizational frameworks to support the Programme of Action and the Bali Declaration on Population and Sustainable Development. Existing population programmes have been revised along thematic areas of concern and priority to the country: reproductive health, the family and women. Malaysia no longer follows a target-oriented approach in the provision of family planning services. Flexibility in programme implementation has allowed creativity in fostering a client-centred approach.

A number of countries in South-central Asia (e.g., Kazakhstan) and Western Asia (e.g., Armenia), which earlier viewed the population growth rate as satisfactory, in 1998 perceived it as too low and changed their policy of maintaining the growth rate to a policy of raising it. The location of the Semipalatinsk nuclear testing ground and the Aral Sea within the borders of Kazakhstan, as well as social and economic factors related to an economy in transition, have adversely affected the health of the population. Some of the difficulties are reflected in a decline in the total health index—namely, a reduction in the birth rate, an increase in the death rate, a reduction in the rate of natural increase and life expectancy of the people, and high morbidity. Further, emigration has resulted in a decrease in the size of the population. As a result of this situation, the strategic goal of the country is now to increase the size of the population.

Of the 16 Governments of Western Asia whose views regarding population growth were known, six still consider their growth rate to be too low and have a policy to increase it. This is despite the fact that their annual growth rate varies from 1.8 per cent in Cyprus to 3.8 per cent in Oman and their total fertility rates vary between 2.3 (Cyprus) and 6.7 (Oman) children per woman. However, the Government of Cyprus changed its policy of increasing population growth to a policy of non-intervention. The Governments of Iraq and Saudi Arabia, which earlier viewed the population growth rate as too low, in 1998 perceived it as satisfactory and changed their policy of increasing population growth to a policy of maintaining it. The Government of Israel considers both the rate of population growth and the level of immigration to be unsatisfactory because they are too low. The Government also views the emigration level as too high. The main goal of population policy in Israel is to increase the size of the population. Higher population growth rates are encouraged through measures aimed at increasing fertility and immigration. Kuwait considered its population growth rate to be satisfactory in 1993, but expressed a mixed view of its growth rate in 1998. The Government viewed the present growth rate of Kuwaitis as satisfactory and that of non-Kuwaitis as too high. Accordingly, a policy has been adopted to maintain the present rate of growth for Kuwaitis and to reduce the rate of growth for non-Kuwaitis.

In Latin America and the Caribbean, an increasing number of countries consider their population growth rates to be satisfactory. In particular, the Governments of Costa Rica and Dominica have changed their view of the growth rate from too high to a view of it as satisfactory and have also changed from a policy of reducing the growth rate to a policy of non-intervention. Although a majority of the small, densely populated countries in the Caribbean, and some countries in Central America, consider population growth to be too high, almost all countries in South America consider it to be satisfactory. Thus, the majority of countries in Latin America and the Caribbean (62 per cent) consider their population growth rates to be satisfactory, and only two countries, Uruguay and Belize, consider population growth to be too low. The Government of Uruguay has a policy of increasing population growth.

In Oceania, both Australia and New Zealand remain satisfied with their population growth rates. The majority of developing countries consider their rates of population growth to be too high. Fiji and Tonga are an exception; high rates of emigration led these Governments to revise their policies in an effort to reduce their population growth.

The continuing high fertility in the majority of the developing countries of Oceania is reflected in the very young age structure. As a result, the overall dependency ratio is likely to remain high in the future. Currently there exist very few programmes that aim to resolve the specific problems of adolescents, such as those connected with reproductive health. The early marriage of girls, especially those with little or no education, pose a great challenge for the Government of Papua New Guinea. Formal education of girls ends with their marriage; thus, there is scope for information and education campaigns directed at both parents and young people. In terms of access to education, girls continue to be disadvantaged in comparison with boys, although great progress has been made over the years. Although teenage pregnancy rates are high in Vanuatu, chiefs and families in villages often do not support the notion of making contraception available to unmarried couples or multi-sex partners because such behaviour is against cultural norms and values. As a result, a considerable number of unwanted pregnancies occur. One of the areas under serious consideration by Governments in some of these countries is sex education in the schools.

In Europe, an increasing number of countries are concerned with issues of declining fertility, depopulation and ageing. The Governments of Austria, Lithuania, the Russian Federation and Slovakia, which considered their population growth as satisfactory in 1993, shifted to a view of it as too low. In 1998, of the nine Governments of Eastern Europe whose views regarding population growth were known, seven considered it to be too low. Many of these Governments inaugurated policies to modify the current

demographic situation, increase population growth and reverse population decline—through measures to increase fertility, improve health services, and reduce infant and maternal mortality and the mortality of the working-age population, especially of men.

In the Russian Federation, the total fertility rate declined from 2.1 in 1985-1990 to 1.3 children per woman in 1995-2000. Population size has been declining since the early 1990s, the number of marriages has declined and the number of divorces has risen. The Government has taken measures to strengthen the family as an institution as well as to protect mothers and children. A Family Code was adopted in 1995, maternity leave has been extended and the number of women examined early in pregnancy has been increasing. Grants given to children and to women who look after children have been increased.

The low life expectancy in the Russian Federation, Ukraine and some other Eastern European countries is due to a number of factors such as stress, pollution, malnutrition and the reappearance of epidemic diseases such as diphtheria and cholera. The Governments are particularly concerned with rising mortality among males in the economically active ages, which in the case of the Russian Federation is four to five times higher than female mortality. The current health situation in these countries has been adversely affected by the complex economic situation. The material base of the health sector is obsolete and health-care services have deteriorated sharply. During the transition period these countries have come up against the problem of large-scale poverty and growing social stratification. Difficulties exist in providing adequate social protection and health care because of structural changes in those sectors and widespread disruption of supplies of medical equipment and medicine. Since 1993, the Russian Federation has been effecting a transition from universal free medical services to a public health system based on compulsory and voluntary insurance.

The Government of Yugoslavia considered its population growth rate to be satisfactory in 1993, but expressed a mixed view of its growth rate in 1998, perceiving it to be too low in some parts of the country and too high in others because of great regional differences in fertility and natural increase. The Government is concerned about the insufficient replacement of generations in some regions and the very fast reproduction and high natural growth in others; the parallel existence of a young age structure and advanced ageing of the population among regions; and imbalances in the spatial distribution of population, with low- and high-density areas. The policy of the Government is aimed at achieving a moderate rate of growth by harmonizing the present highly differing regional rates.

Among the 24 countries of Europe that have already responded to the Eighth United Nations Inquiry among Governments on Population and Development, nine (38 per cent) indicated that their target is to raise fertility. Although France still considers its fertility level to be too low, it has shifted from a policy of raising the fertility level to a policy of maintaining it. Yugoslavia indicated an intention to harmonize the fertility levels existing in different parts of the country. Population ageing was a concern in 18 countries (75 per cent). Among them, 11 countries (46 per cent) considered the ageing of the population to be a major concern. Many Governments have elaborated and introduced different policy measures dealing with ageing, which are described in the following chapter.

NOTES

[1]Other criteria for determining the timing of the onset of fertility decline have been used in other studies (Kandiah and Horiuchi, 1995; Casterline, 1998). The two criteria used in this report use some of the elements applied by Kandiah and Horiuchi, and some of those employed by Casterline.

It is possible that countries with total fertility of above six births per woman during 1970-1975 could have already begun their fertility transition prior to 1970, starting from a much higher level of fertility. For such countries, the criteria used in this report would move the timing of the onset of transition farther forward than would be the case if the study covered the period before 1970.

[2]The target level of 60 years had been set for the year 2000 in the Global Strategy for Health for All by the Year 2000 and reiterated in the Programme of Action of the World Summit for Social Development.

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III. CHANGING POPULATION AGE STRUCTURES

Changes in the age structure of the population are an inevitable consequence of the demographic transition from high to low fertility and mortality rates. Many societies, especially in the more developed regions, have already attained older population age structures than ever seen in the past. Many developing countries in the midst of the demographic transition are experiencing rapid change in the relative numbers of children, youth and adults.

A. DEMOGRAPHIC ASPECTS

1. *Children*

The world population under age 15 was estimated to be 1.79 billion in 1998. Among these children, 12 per cent lived in the more developed regions and 88 per cent in the less developed regions (table III.1). Between 1970 and 1998, the world child population increased from 1.39 billion to 1.79 billion, a 29 per cent increase. According to the United Nations' medium-fertility-variant population projections, the number of children under age 15 in the world will grow only about 2 per cent more in the coming years, and after 2025 will decrease gradually to 1.75 billion in 2050, about the same number as today (figure III.1). In the less developed regions, the average annual growth rate of the child population was 1.6 per cent per year in the decade 1970-1980, but has slowed to an estimated 0.8 per cent per year for the decade of the 1990s. In the more developed regions, the number of children has already been declining since 1965.

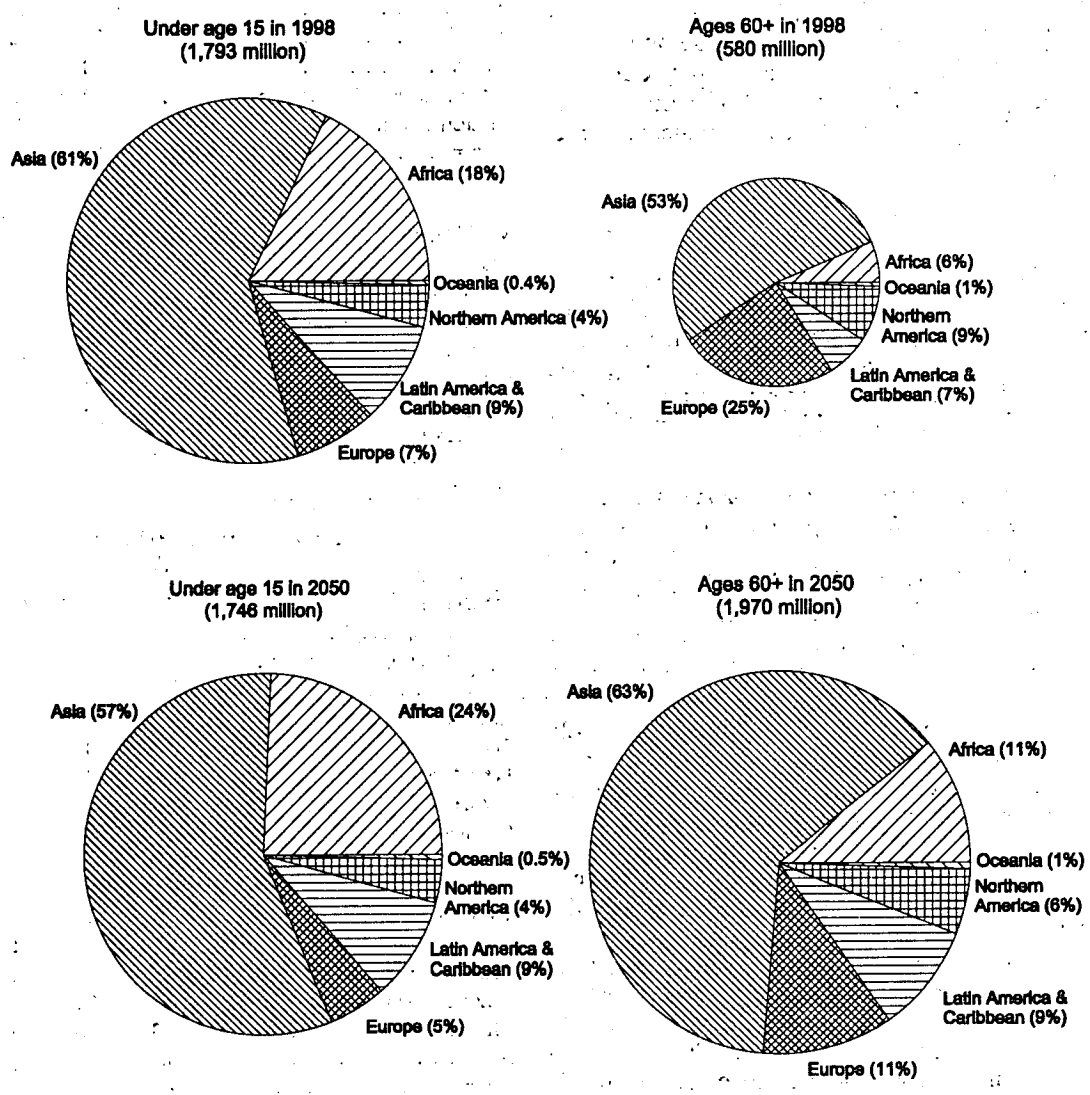
Children under age 15 currently make up 19 per cent of the population of the more developed regions, 33 per cent of that in the less developed regions, and 43 per cent in the least developed countries (table III.2 and figure III.2). In both more and less developed regions those percentages were substantially higher in 1970, at 26 per cent and 42 per cent, respectively. All regions but Africa have experienced large declines in the percentage under age 15; in Africa the percentage declined only from 45 per cent to 43 per cent between 1970 and 1998. Further decrease in the proportion of children is projected between now and 2050 in all regions, but the main trends will appear in the less developed regions. By 2050, children are projected to make

TABLE III.1. ESTIMATED AND PROJECTED REGIONAL DISTRIBUTION OF THE POPULATION UNDER AGE 15 AND AGED 60 OR OVER, 1970, 1998 AND 2050
(Percentage; medium-variant projections)

Region	*Under age 15*			*Aged 60 or over*		
	1970	*1998*	*2050*	*1970*	*1998*	*2050*
World total	100	100	100	100	100	100
More developed regions	19	12	10	47	39	19
Less developed regions	81	88	90	53	61	81
Least developed countries	10	15	20	5	5	9
Africa	12	18	24	6	6	11
Asia	63	61	57	45	53	63
Eastern Asia	27	20	15	23	27	26
China	24	18	14	18	21	22
South-eastern Asia	9	9	9	5	6	9
South-central Asia	24	29	28	15	17	25
India	16	19	17	11	13	16
Western Asia	3	4	5	2	2	3
Europe	12	7	5	33	25	11
Latin America and the Caribbean	9	9	9	6	7	9
Northern America	5	4	4	10	9	6
Oceania	0.4	0.4	0.5	1	1	1

Source: *World Population Prospects: The 1998 Revision*, vol. II, *The Sex and Age Distribution of the World Populations* (United Nations publication, Sales No. E.99.XIII.8).

Figure III.1. Geographic distribution of the population under age 15 and aged 60 or over, 1998 and 2050



Source: *World Population Prospects: The 1998 Revision*, vol. II, *The Sex and Age Distribution of World Populations* (United Nations publication, Sales No. E.99.XIII.8).

up between 17 and 20 per cent of the population of most regions, but 14 per cent in Europe and 24 per cent in Africa.

The areas with the largest shares of the world child population in 1998 were Asia, Africa and Latin America and the Caribbean, which were home to 61 per cent, 18 per cent and 9 per cent, respectively, of the world child population. China and India, the first and second most populous countries, each contain 18-19 per cent of the world child population. As a result of differential growth rates, the regional composition of the world population under age 15 will change (table III.1 and figure III.3). The greatest change in the projected geographic distribution from 1995 to 2050 is seen for Africa, which is projected to increase its share from 18 to 24 per cent. The proportion of the world child population will decline in most other regions.

2. *Youth*

Ages 15-24 represent a transition from childhood to adulthood in most societies. Many young men and women enter the labour force, marry and begin childbearing during this period of life. For society as a whole, rapid growth in the number of young people means a rapid growth in the demand for secondary and higher education, jobs and housing.

The world youth population aged 15-24 numbered 1.04 billion in 1998, almost 60 per cent more than the number in 1970. By 2050, the youth population is projected to be 13 per cent larger than today, 1.18 billion. Youth currently make up 18 per cent of the world population, ranging from 13-14 per cent of the population of Europe and Northern America to 20 per cent in Africa and in Latin America and the Caribbean (table III.2). In contrast to the declining trend for the child population, the proportion aged 15-24 has changed very little since 1970 for the world as a whole; decreases in the proportion are evident in the more developed regions, where the youth population has been decreasing in absolute numbers since the decade of the 1980s, but at the global level this trend is counterbalanced by increases in many developing countries. Between 1998 and 2050 the growth rate of the world youth population is projected to slow, approaching a zero growth rate after 2010 for the world as a whole. However, in the least developed countries, the youth population will continue to grow at over 1 per cent per year until after 2030. The population share of age group 15-24 in the total population is projected to decrease between 1998 and 2050, from 14 to 11 per cent in the more developed regions, from 19 to 14 per cent in the less developed regions and from 20 to 17 per cent in the least developed countries.

3. *Ages 60 or over*

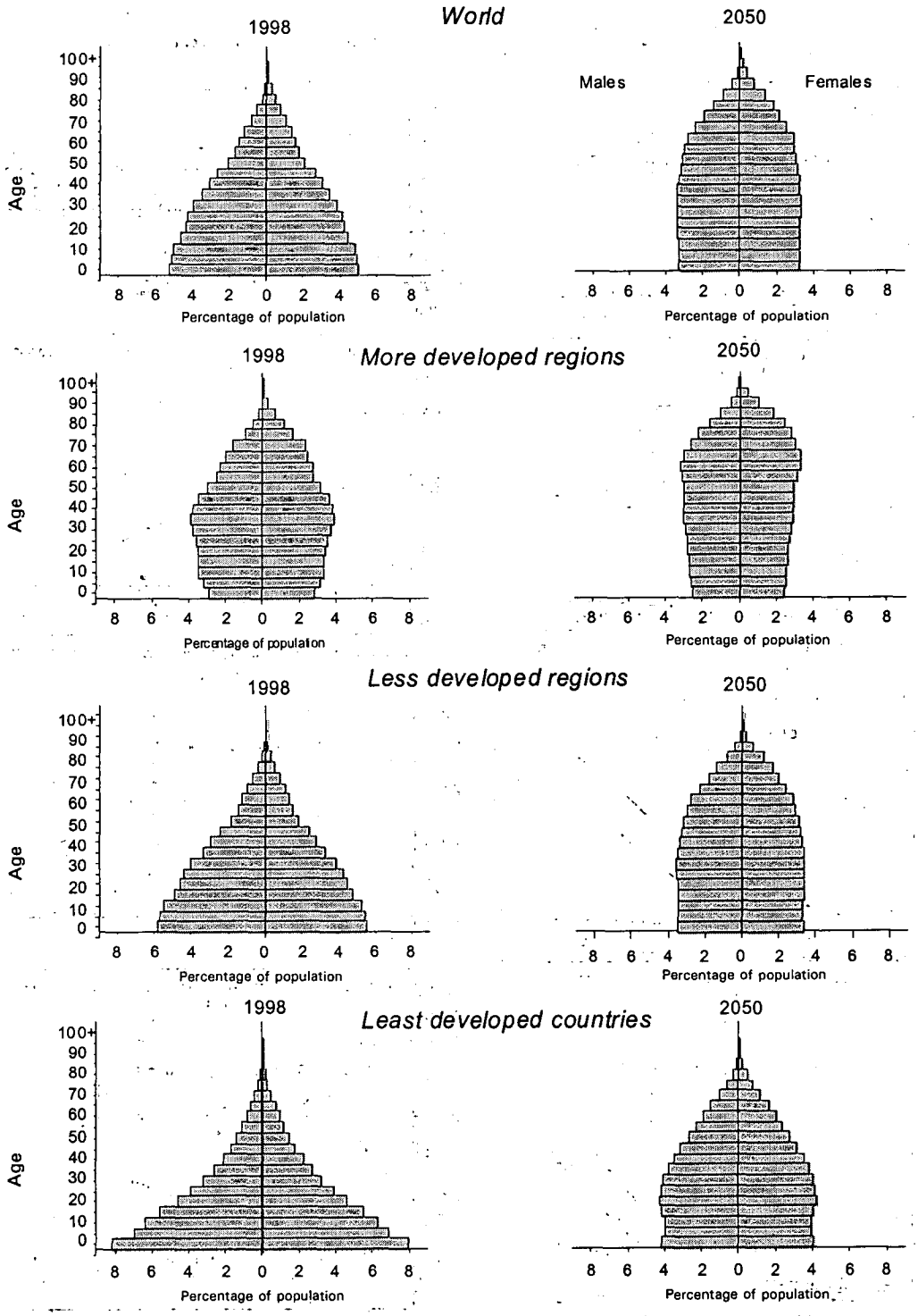
The world population of older persons is considerably smaller than the child population, but the older population is growing at a much faster rate. The number of persons aged 60 years or over is estimated to be 580 million in 1998. By 2050, it is projected to be more than three times as large, nearly 2 billion, at which time it will be larger than the world child population. The growth of the older

TABLE III.2. ESTIMATED AND PROJECTED PERCENTAGE OF THE POPULATION IN SELECTED AGE GROUPS, BY REGION
(*Medium-variant projections*)

Region	*1970*	*1998*	*2025*	*2050*
Children: under age 15				
World total	37	30	23	20
More developed regions	26	19	16	15
Less developed regions	42	33	25	20
Least developed countries	44	43	35	24
Africa	45	43	35	24
Asia	40	31	22	19
Europe	25	18	15	14
Latin America and the Caribbean	42	32	24	20
Northern America	29	22	18	17
Oceania	32	26	21	19
Youth: ages 15-24				
World total	18	18	15	13
More developed regions	17	14	11	11
Less developed regions	18	19	16	14
Least developed countries	18	20	20	17
Africa	18	20	20	17
Asia	18	18	15	13
Europe	16	14	10	10
Latin America and the Caribbean	19	20	16	13
Northern America	17	13	12	12
Oceania	18	16	14	13
Older persons: ages 60 or over				
World total	8	10	15	22
More developed regions	15	19	28	33
Less developed regions	6	8	13	21
Least developed countries	5	5	6	12
Africa	5	5	6	12
Asia	6	9	15	24
Europe	15	20	28	35
Latin America and the Caribbean	6	8	14	22
Northern America	14	16	26	28
Oceania	11	13	20	24
Oldest old: ages 80 or over				
World total	1	1	2	4
More developed regions	2	3	5	9
Less developed regions	0.4	1	1	3
Least developed countries	0.3	0.3	1	1
Africa	0.3	0.1	1	1
Asia	0.4	1	2	4
Europe	2	3	5	9
Latin America and the Caribbean	1	1	2	4
Northern America	2	3	4	8
Oceania	1	2	3	6

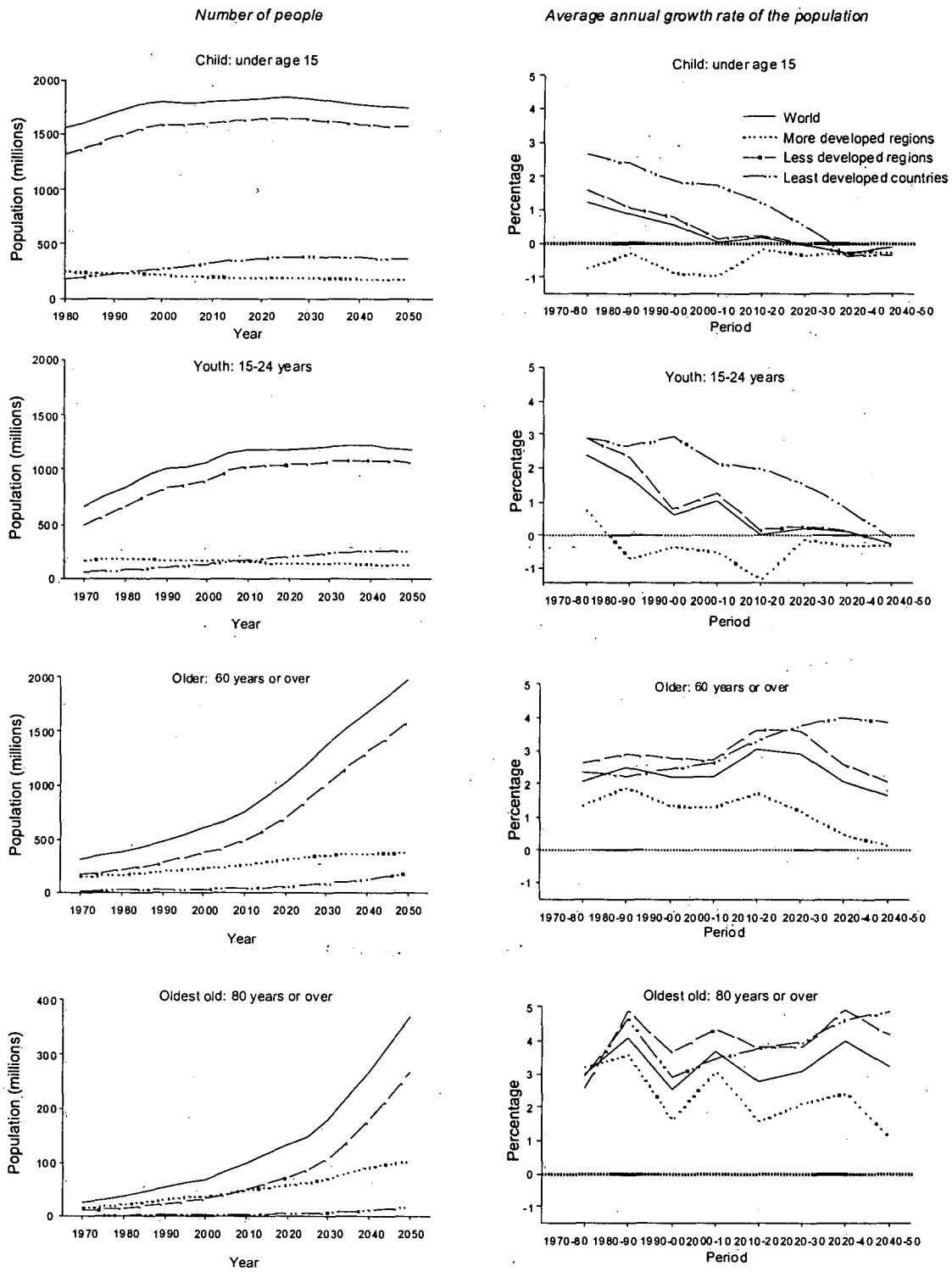
Source: *World Population Prospects: The 1998 Revision*, vol. II, *The Sex and Age Distribution of the World Populations* (United Nations publication, Sales No. E.99.XIII.8).

Figure III.2. Population pyramids: age and sex distribution, 1998 and 2050



Source: *World Population Prospects: The 1998 Revision*, vol. II, *The Sex and Age Distribution of World Populations* (United Nations publication, Sales No. E.99.XIII.8).

Figure III.3. Growth in population size and age-specific annual growth rates, for the child, youth and older populations, 1970-2050



Source: World Population Prospects: The 1998 Revision, vol. II, *The Sex and Age Distribution of World Populations* (United Nations publication, Sales No. E.99.XIII.8).

population often receives attention in connection with the developed countries. However, the older population is increasing at a substantially faster rate in the less developed than in the more developed regions (figure III.1).

Persons aged 60 or over currently make up 10 per cent of the world's population. The percentage is much higher in the more developed regions (19 per cent) than in the less developed regions (8 per cent). It is especially low in the least developed countries (5 per cent). Among individual countries, the highest percentages are currently found in Italy (24 per cent) and Greece (23 per cent). Many other European countries, as well as Japan, have proportions nearly as high. By 2050, the older ages will make up a projected 22 per cent of the world population—33 per cent in the more developed regions, 21 per cent in the less developed regions, and 12 per cent in the least developed countries.

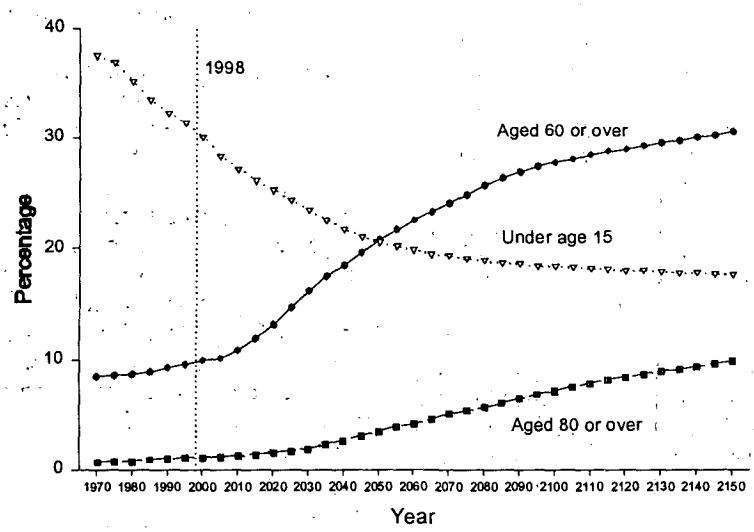
The oldest old, persons aged 80 years or more, currently number 66 million. They make up about 1 per cent of the world's population and 3 per cent of the population of the more developed regions. This oldest age group is however growing even faster than the older population as a whole. By 2050, the number of the oldest old is projected to be 5.6 times as large as at present. By that date, the oldest old will be 4 per cent of the total world population, and in the more developed regions, one person out of 11 is projected to be aged 80 or more.

Of the geographic regions, Asia currently has the largest share of the older population, 53 per cent. Europe has the next largest share, 25 per cent (table III.1 and figure III.3). Asia's share of the older population will increase to 63 per cent by 2050, while the share of Europe will show the greatest relative decrease of any region, from 25 per cent to 11 per cent.

The regional composition of the world's older population is very different from that of the population under age 15. In 1998, the more developed regions contained approximately two fifths of the world's older people, but only one out of every eight children under age 15. By 2050, the more developed regions will contain less than one fifth of the world's older persons. Even in 2050, though, the regional distribution of the older population will differ significantly from that of the child population. A further contrast between the trends for the younger and older age groups is that, even in the decade 2040-2050, the older population will still be growing at an annual rate in excess of 1.7 per cent—and the population aged 80 or over is projected to be growing by more than 3 per cent per year. By that time, the youth and child populations are projected to have near-zero growth rates.

It is necessary to look beyond 2050 to see the full consequences for population ageing of ongoing trends towards lower fertility and mortality rates. A range of alternative scenarios presented in the United Nations long-range population projections (United Nations, 1998) show that future populations will reach a significantly older age structure than the populations of the present, or even of the populations of 2050. Figure III.4 shows projected trends in the proportion of the world's population aged 60 or over through the year 2150, from the medium-fertility scenario, which assumes that all regions will have reached and will maintain replacement-level fertility after 2050 and that mortality rates will continue to improve. By 2150, persons aged 60 or over are projected to number 3.3

Figure III.4. Percentage of the world population under age 15, aged 60 or over and aged 80 or over, 1970-2150
(Medium-fertility scenario)



Source: *World Population Projections to 2150* (United Nations publication, Sales No. E.98.XIII.14).

billion, nearly one person out of every three alive at that time. One in every 10 persons will be aged 80 or more. Only 18 per cent of the population will be a child under 15 years of age.

4. *Age patterns of the sex ratio*

Women outnumber men at the oldest ages (table III.3). At ages 60 or over, there were an estimated 81 men for every 100 women globally in 1998, and at ages 80 or over there were only 53 men for every 100 women. This is because women are generally more likely to survive to older ages. The sex ratios of older age groups are lower in the more developed regions than in the less developed regions, since there are larger differences in life expectancy between the sexes in the more developed regions. In addition, the sex ratio in the oldest age groups in the more developed regions retains the effect of the heavy loss of men in the armed forces in some countries during the Second World War.

TABLE III.3. SEX RATIOS BY AGE IN THE MORE AND THE LESS DEVELOPED REGIONS, 1998
(Men per 100 women; medium-variant projections)

Age	*World*	*More developed regions*	*Less developed regions*
For broad age groups			
Total	101	95	103
<15	106	105	106
15-59	103	100	104
60+	81	70	88
80+	53	44	64
For 5-year groups, ages 60 or over			
60-64	94	88	97
65-69	89	81	93
70-74	79	70	86
75-79	69	59	78
80-84	59	50	69
85-89	47	41	59
90-94	36	32	47
95-99	28	24	39
100+	26	21	37

Source: World Population Prospects: The 1998 Revision, vol. II, *The Sex and Age Distribution of the World Populations* (United Nations publication, Sales No. E.99.XIII.8).

The relative deficit of men increases rapidly with rising age, after age 60. At ages 60-64 there are 94 men for each 100 women, at ages 80-84 there are 59, and at ages 90-94 only 36. Among the very small proportion who have survived beyond age 100, there are estimated to be about four women for every man.

Given the age patterns of the sex ratio, the rapid growth of the elderly population and the increase in the proportion in older age groups imply a decrease in the sex ratio for the total population and a greater increase in the number of older women than of older men. Projected increases between 1998 and 2050 in the number of persons aged 60 or over are 655 million for men and 753 million for women in the world as a whole. Projected increases during the same period in the number of persons aged 80 or over are 118 million for men and 184 million for women.

5. *Demographic causes of population ageing*

The process of population ageing is determined primarily by trends in fertility rates and secondarily by mortality rates. Any population with a long history of high fertility has a "young" age structure, similar in its general features to the present age structure for the group of least developed countries (see figure III.2). The average age of the population starts to rise when fertility rates decline. The impact of mortality decline is more variable, depending on whether the decline in mortality operates mainly at younger or at older ages. In fact, the first stages of mortality decline have usually particularly benefited infants and children, and have often served to make the population younger. However, changes in mortality may assume a greater importance for population ageing later in the demographic transition. In countries where mortality rates at young ages are already low, further declines have tended to affect mainly the adult and older ages and have contributed to population ageing.

For example, Caselli and Vallin (1990) have demonstrated the growing impact of mortality change in population projections for France and Italy. They concluded that even if Italian fertility remained at a very low level of 1.4 children per woman through the year 2040, more than half the increase in the proportion of the population aged 60 or over would be due to mortality change, and less than half to the earlier fertility trends.

6. *Trends in dependency ratios*

Demographic dependency ratios are used as approximate indicators of the relative sizes of the non-working-age and working-age populations. The youth-dependency ratio (the number of children per 100 persons of labour-force age, ages 15-64 years) and the elderly-dependency ratio (the number aged 65 years or over per 100 persons of labour-force age) indicate the dependency burden on workers and how the type of dependency shifts from children to the elderly during the demographic transition. The potential economic implications of falling or rising burdens of demographic dependency have been a topic of active research among population economists, as discussed later in the present chapter as well as in chapter V.

Since 1970, the youth dependency ratio has been declining in all regions, while the over-65 dependency ratio is rising (table III.4). Trends for the total ratio in different countries and regions depend upon the relative size and speed of these countervailing trends in the older and

younger components. In general, the total dependency burden declined between 1970 and 1998. In the more developed regions, the total dependency ratio decreased over that period from 56 to 49 dependent-aged persons per 100 aged 15-64. The ratio will increase between the present and 2025 and is projected to rise further, to 70, by 2050. In the less developed regions the overall dependency ratio in 1970 was 84, much higher than in the more developed regions, but it decreased rapidly to 62 by 1998, is projected to decline further to 50 by 2025 and then to increase slightly between 2025 and 2050.

TABLE III. 4. TRENDS IN AGE-DEPENDENCY RATIOS, BY REGION, 1970 TO 2050

(Percentage; medium-variant projections)

Region	*1970*	*1998*	*2025*	*2050*
Dependency ratio: total				
World total	75	59	51	56
More developed regions	56	49	58	70
Less developed regions	84	62	50	54
Least developed countries	90	84	63	47
Africa	92	86	63	47
Asia	80	57	48	57
Europe	56	48	56	72
Latin America and the Caribbean	87	60	50	58
Northern America	62	52	59	64
Oceania	65	55	56	60
Under age 15				
World total	66	48	36	31
More developed regions	41	28	25	26
Less developed regions	77	54	37	31
Least developed countries	84	78	56	35
Africa	86	80	56	35
Asia	73	48	33	30
Europe	39	27	23	25
Latin America and the Caribbean	79	52	35	32
Northern America	46	33	29	28
Oceania	53	40	33	30
Ages 65 or over				
World total	10	11	16	26
More developed regions	15	21	33	44
Less developed regions	7	8	13	23
Least developed countries	6	6	6	12
Africa	6	6	6	12
Asia	7	9	15	27
Europe	16	21	33	47
Latin America and the Caribbean	8	8	14	27
Northern America	16	19	30	36
Oceania	12	15	23	30

Source: World Population Prospects: The 1998 Revision, vol. II, *The Sex and Age Distribution of the World Populations* (United Nations publication, Sales No. E.99.XIII.8).

NOTE: The ratios show the ratio of the numbers of persons under age 15 and over age 65 to the number aged 15-64, expressed as a percentage.

The amount and pace of change in demographic dependency ratios varies greatly between countries. Large swings in dependency ratios are typically initiated or accentuated by rapid fertility declines, but those effects take many years to play out. Four examples are shown in figure III.5 to illustrate a range of situations and trends:

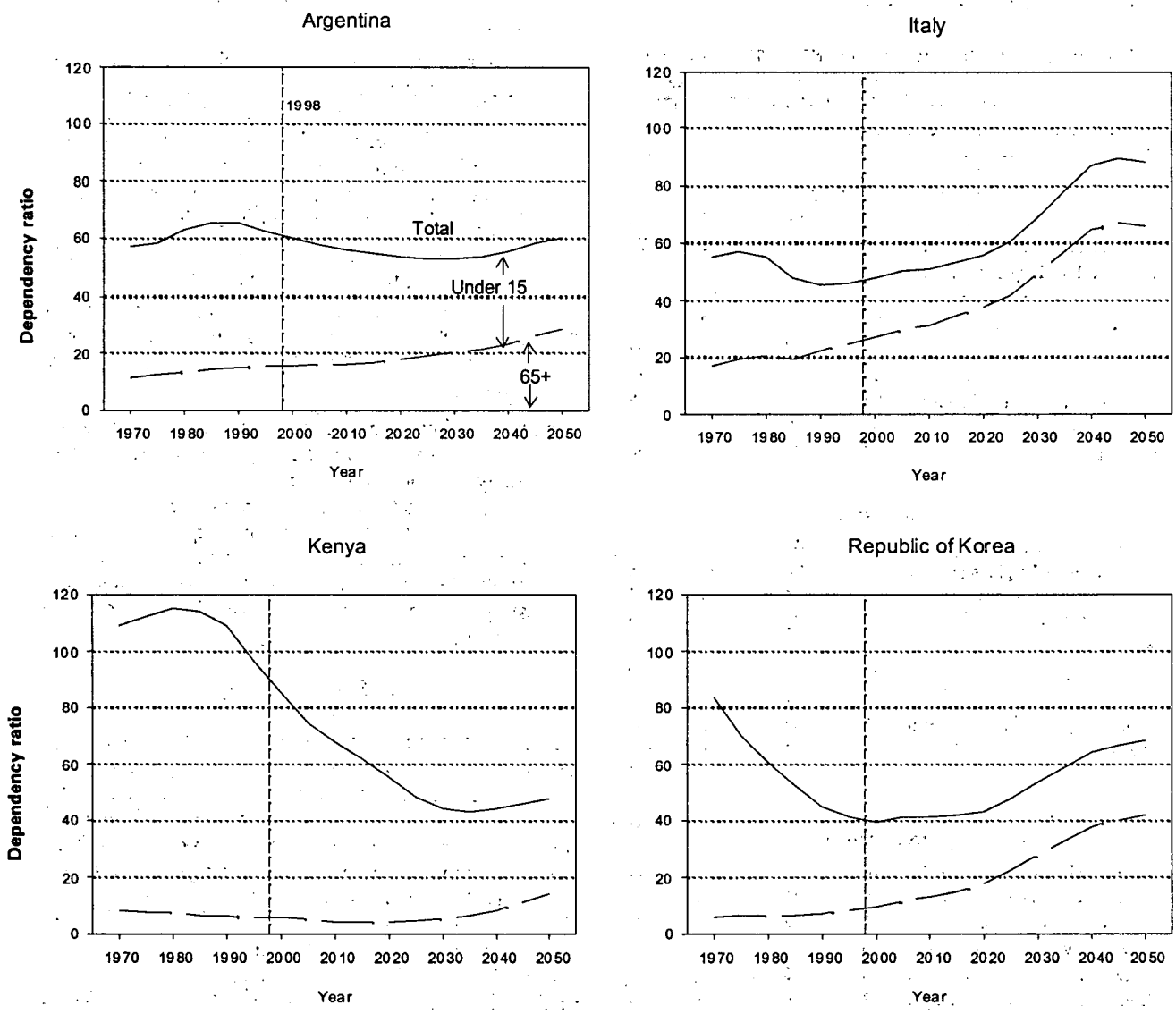
- Argentina has experienced a gradual fertility decline with relatively minor fluctuations over a long period. It is expected to experience only minor changes in the total dependency ratio, which will remain near 60 over the whole period from 1970 to 2050.
- In Italy, the total fertility rate plummeted after the mid-1970s to reach the unprecedentedly low level of 1.2 by the early 1990s. The total dependency ratio initially declined, but increases in the over-65 dependency ratio will dominate the trend into the future and will produce an especially rapid rise in demographic dependency after 2020.
- The Republic of Korea experienced a very rapid fertility decline after 1970, and the total dependency ratio fell to an unusually low level of 39 by 1998. The overall ratio will not begin to rise appreciably until after 2015, but it will then increase rapidly.
- Kenya shows an extremely high child dependency ratio, with a total dependency ratio of 115 in 1980. Kenya had one of the highest levels of fertility in the world, estimated at 8.1 children per woman during the period 1960-1980, before beginning a rapid fertility decline which is projected to continue. By 1998, Kenya's under-15 and over-65 ratios were similar to those seen in the Republic of Korea 30 years earlier.

7. *Speed of ageing*

Rapid changes in age structure may be more difficult for societies to accommodate than the same amount of change that is spread out over a long time. Figure III.6 shows, for selected countries, the dates when the population reached, or is expected to reach, the point when 7, 14 and 21 per cent of the population was aged 65 or above. (Currently, 6.8 per cent of the world's population is aged 65 or more.) Typically, the transition from 7 to 14 per cent took longer for countries that reached the 7 per cent level at an earlier date. For example, France and Sweden, which reached the 7 per cent point before 1900, took 114 years and 82 years, respectively, to reach 14 per cent. That same transition required only 24 years in Japan, from 1970 to 1994. Several developing countries shown in figure III.6 will also make a rapid transition from 7 to 14 per cent aged 65 or more. Brazil, Indonesia, the Republic of Korea, and Tunisia are projected to make this transition in a time-span of under 25 years, and the two largest countries, China and India, may require only 25 and 28 years, respectively.

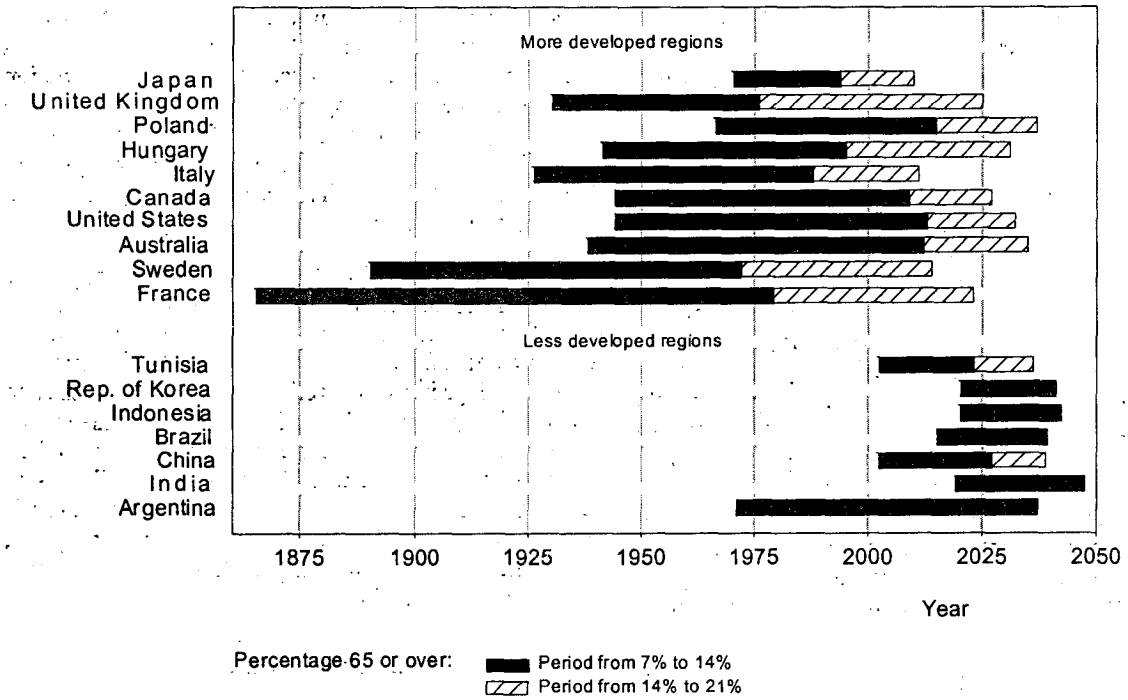
Figure III.5. Estimated projected trends in age-dependency ratios in selected countries

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



Source: World Population Prospects: The 1998 Revision, vol. II, *The Sex and Age Distribution of World Populations* (United Nations publication, Sales No. E.99.XIII.8).

Figure III.6. Time when the percentage of the population aged 65 or over reached or will reach 7, 14 and 21 per cent: selected countries



Source: World Population Prospects: The 1998 Revision, vol. II, *The Sex and Age Distribution of the World Populations* (United Nations publication, Sales No. E.99.XIII.8); United States Bureau of the Census, *An Ageing World II*, International Population Reports, P95/92-3 (Washington, D.C., Government Printing Office, 1992).

NOTE: For countries where the percentage aged 65 or over will reach 21 per cent after the year 2050, only the period between attainment of the 7 and 14 per cent points is shown.

In many cases, it will take substantially less time for the transition from 14 per cent to 21 per cent (figure III.6). Although no country today has yet reached the point where 21 per cent of the population is aged 65 or more, some countries, including Italy and Japan, are expected to reach that point before the year 2015. In Japan the transition from 14 to 21 per cent will have taken only 16 years, and in Italy 23 years. At a later date, Canada and the United States of America are also expected to make a very rapid transition from 14 to 21 per cent aged 65 or over, as their large "baby boom" cohorts enter the higher ages. China and Indonesia may make that transition in an even shorter span of time. Thus, in the near future some societies will be faced not only with older populations than have ever existed at the national level, but populations that are ageing at an extremely rapid pace.

B. SOCIO-ECONOMIC ASPECTS

The declining share of population under 15 years of age and increasing share of population aged 60 or above are likely to have wide-ranging economic and social consequences through such factors as economic growth, savings and investment, labour supply and employment, pension schemes, health and long-term care, intergenerational transfers, taxation, family composition and living arrangements, socio-economic status, productive ageing and quality of life.

While once only limited to developed countries, concern for the consequences of changing age structure, in general, and ageing, in particular, has spread to many developing countries, particularly in Asia and Latin America, which have experienced rapid fertility declines in recent years. The concern over ageing in these countries is not so much due to the level of ageing, but to the pace, which is more rapid than in developed countries. As of 1998, 61 countries in the world, representing 44 per cent of the world's population were at or below replacement fertility. By 2015, the world's population is projected to reach 7.2 billion, of which two thirds will be living in 88 countries at or below replacement fertility (United Nations, 1997).

Research on the interrelations between changing age structure and development has generally focused on problems in a low-fertility, developed country setting. Nevertheless, the analysis of these interrelations are not likely to differ methodologically from those relevant for countries at an earlier stage of the demographic transition. In both cases, the analysis needs to examine the determinants and consequences of age structure in relation to development.

1. *Economic growth, savings and investment*

Demographic factors have always played an important role in economic theory. Because economic growth is fuelled by savings, much attention has been devoted to examining the relation between savings and changing age structure. The life-cycle hypothesis implies that the higher the old-age dependency ratio (the proportion of the population aged over 65 to the working-age population), the lower will be aggregate household saving, as people dissave during retirement. This finding is generally supported by econometric evidence and survey information, which indicates that the age-specific saving rate peaks towards the end of working life and falls in retirement among developed market economies (Callen and Thimann, 1997). What remains controversial, though, is how important this phenomenon may be for a country's overall economic performance.

The impact that demographic changes may have on economic growth can be illustrated with the use of simulations. One recent study found that, based on projected demographic changes to 2020, future national savings may dramatically decline in a number of countries. The largest impact of ageing is expected in Japan, where the gross domestic product may be 14 per cent lower by the year 2020 than if the age structure had remained the same as in 1995. It is believed that Europe and the United States will be affected to a lesser extent by ageing, with their respective levels of gross domestic product reduced 4.5 per cent and 2.4 per cent by 2020 (OECD, 1997). The adverse effects of ageing are expected to extend well beyond 2020. Ageing's effects are transmitted through three main channels: a shrinking labour force, reduced household savings and increased government expenditures on pensions and health care.

In a developing country context, the notion that a large proportion of youth stifles economic growth by hampering a country's ability to generate savings has its antecedents in a seminal study done over 40 years ago (Coale and Hoover, 1958). Recent empirical work appears to support the hypothesis that a high proportion in the working ages, which follows fertility decline, is favourable for economic growth. Countries in sub-Saharan Africa with a rising or high and stable share of population under age 15 also have declining or persistently low rates of savings (Higgins, 1997). This contrasts with Eastern Asia, where evidence suggests that part of the rapid growth in per capita income from 1965 to 1990 was attributable to the rising share of working-age population (Asian Development Bank, 1997). A corresponding shrinking in the share of the child population led to fewer expenditures on children, inducing higher rates of saving and investment. Favourable demographic conditions, however, were necessary but not sufficient to produce economic growth. Rather, an expanding labour force combined with flexible labour markets, human capital investment and an outward orientation, such as a successful export promotion programme, generated high levels of employment (Lee and others, 1997). In the absence of such employment-generating policies, a large cohort of working-age population may translate into high levels of unemployment, a situation similar to that in Europe in recent years.

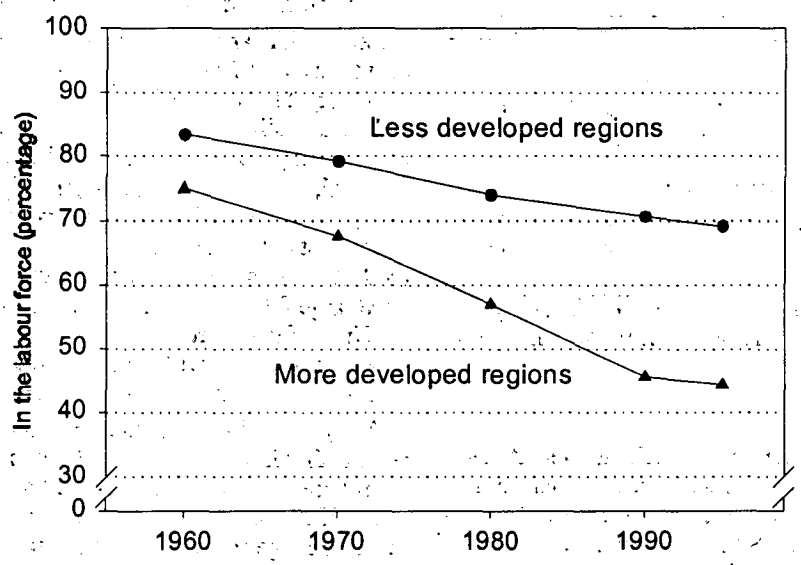
One study estimated that for all of Asia, demographic factors contributed a 5 per cent increase in household savings. Government savings also accrued, as a larger workforce translated into a larger pool of taxpayers. Greater savings imply less reliance on foreign capital, and much of the differential in foreign capital dependency between South and East Asia is explained by the size of the youth dependency burden (Higgins and Williamson, 1997). The transitory rise in the savings rate, however, is expected to be partially reversed, as dissaving takes place, by families and Governments diverting resources to care for an ageing population.

2. *Labour markets*

By moulding the size, age structure and composition of the potential workforce, demographic change is an important determinant of labour supply. Among the 12 States members of the European Union, the working-age population grew at a faster rate than the total population from 1975 to 1995. This growth, combined with increasing female labour participation and the lack of employment generation, has contributed to the persistence of high unemployment in Europe. Only after 2010 is the size of the working-age population expected to decline, relieving some of the demographic pressure on labour markets (European Commission, 1998).

One of the most prominent features of labour markets in developed countries has been the unprecedented withdrawal of older men from the workforce over the last three decades (figure III.7). Beginning in 1960 and accelerating in the 1970s, labour-force participation has dropped sharply among men aged 60-64, while falling gradually among those aged 55-59. This has occurred despite increases in life expectancy at older ages, improved health and rising educational levels, all of which should have stimulated labour-force participation of older men. The most pronounced declines among men aged 60 to 64 years have taken place in Belgium, Italy, France and the Netherlands, where by 1996 the participation rate had fallen to below 20 per cent. Smaller, but still significant declines have been observed in Australia, Canada, Finland, Germany, Spain and the United States, among others (Gruber and Wise, 1997).

Figure III.7. Labour-force participation rates, men aged 60-64, 1960 to 1995



Source: International Labour Office, *Estimates and Projections of the Economically Active Population, 1950-2010*, fourth edition (Geneva, 1996).

Many factors exert an influence on the decision to withdraw from the labour force early and include post-retirement versus pre-retirement incomes, the unemployment rate, size of pension benefits and availability of private pension plans, tax structure and inflation rate. Other factors, while not economic, may be no less important, such as job satisfaction, ill health or disability, desire for leisure and presence of dependants. While there is consensus that older male non-participation is due to the combined effects of improved pension benefits and the easing of eligibility, there is little agreement on the magnitude of these effects.

Among developed economies, the average age at retirement has declined for both men and women, dropping some six years between 1950 and 1990 and thus increasing the average duration of retirement from 11 to 17 years for men and from 14 to 23 years for women (Latulippe, 1990). This has led to the widening divergence between average age at retirement and statutory retirement age. Countries with economies in transition have participation and retirement patterns similar to those of Western Europe and North America.

Countries with high per capita incomes tend to have lower participation rates of older workers (Clark and Anker, 1990). This implies that as countries develop, older persons participate less. This is borne out by recent data. More than two thirds of men aged 60 to 64 (69 per cent) were still part of the economically active population in less developed regions in 1995, compared with 44 per cent of men in more developed regions (table III.5). Older men participate to a greater extent in labour markets in developing regions because of the limited coverage of retirement schemes and the small income provided when systems have a wider coverage. Even at the oldest ages, 65 years or above, 43 per cent of men in less developed regions are still working. Among older women, patterns of labour-force participation are quite similar in more and less developed regions. In more developed regions, 23 per cent of women aged 60-64 years are in the labour force, while in less developed regions 31 per cent still work.

That ageing will depress labour-force participation and raise the average age of the labour force are themes which often recur in the literature. Neither of these anticipated impacts has so far been borne out by the Western European experience. Total labour participation has not yet fallen significantly, due to increasing female participation, while the premature departure of older males from the labour force has tended to offset labour-force ageing. As concerns the perception that an ageing workforce is less productive, no relationship between age and productivity has been found (OECD, 1996).

3. *Pension schemes*

Pension schemes have become the focus of much discussion concerning their future viability and solvency, in the wake of the burgeoning legions of retirees. Sparked by the difficulty in sustaining current pension systems, inter-

TABLE III.5. LABOUR-FORCE PARTICIPATION RATES OF OLDER MEN AND WOMEN, MORE DEVELOPED AND LESS DEVELOPED REGIONS, 1995

(*Percentage*)

	Ages		
	55-59	60-64	65 or above
More developed regions			
Males	76	44	13
Females	42	23	6
Less developed regions			
Males	86	69	43
Females	44	31	14

Source: Based on International Labour Office, *Estimates and Projections of the Economically Active Population, 1950-2010*, fourth edition (Geneva, 1996).

est in recent years has centred on seeking alternatives to the traditional pay-as-you-go system, in which current workers pay for the benefits of current retirees. These debates have often been framed against a broader context of redefining the appropriate role of Governments in ensuring a minimum income for older persons and have ushered in a period of innovation and experimentation, particularly in the area of privatization.

While pension-related expenditures are largely a function of demographic ageing, non-demographic factors also play an important role. These factors include the level of contributions and benefits, retirement age, eligibility conditions for early retirement or disability pensions, availability of private pension plans, labour-force participation, rates of unemployment and inflation, economic growth, the size of the informal sector and tax compliance. Part of the fiscal strain on pension schemes in Europe and North America during the previous two decades has been traced to imposing upon these schemes a function for which they were never designed, that is as a mechanism for lowering unemployment by inducing earlier retirement (Mirkin, 1987). Moreover, it appears that early retirement programmes failed to reduce unemployment, as the labour market withdrawal of older workers did not entail their replacement by unemployed workers (OECD, 1996a).

Among the 12 States members of the European Union, expenditures for old age and survivor benefits jumped 59 per cent in real terms between 1980 and 1994 (European Commission, 1997). Assuming that pension policies are unchanged, pension expenditures are projected to peak at around 11 to 15 per cent of the gross domestic product in Austria, Belgium, Finland, France, Germany, Italy, Japan, Portugal, Spain and Sweden by 2050 (OECD, 1996). In contrast, in Australia, Canada, Iceland, Ireland, the United Kingdom and the United States, pension expenditures will increase moderately to less than 10 per cent of gross domestic product. These variations reflect the relative generosity of pension payments and the differences in dependency ratios between the two groups of countries. Although countries with economies in transition are also confronting escalating pension costs, the situation has been aggravated by the transition to a market economy and the erosion of benefits (Castello Branco, 1998).

Faced with varying degrees of insolvency, a number of countries have taken action to rescue pension schemes by bolstering the schemes' viability. Argentina, Australia, Belgium, Bolivia, Colombia, the Czech Republic, Estonia, Hungary, Italy, Kuwait, Latvia, New Zealand, Peru, Portugal, Switzerland, Ukraine, the United Kingdom, the United States and Uruguay have raised or will gradually raise the standard retirement age. In Europe, however, the modest reforms undertaken so far will not be sufficient to avert large future public-sector deficits (Kopits, 1997). In the United States, decisions taken to date to raise the statutory retirement age will induce a modest postponement of retirement—on the order of only a few months.

An examination of standard retirement age by country reveals that in developed countries men become eligible for full pension benefits at age 65 or above in more than one half the countries, while the most common standard retirement age for women is between the ages of 55 and 59 years (table III.6). The standard retirement age in developing countries is often lower than in developed countries, most commonly between the ages of 60 and 64 years for men. For women, the standard retirement age is 64 or lower in 94 per cent of developing countries. The differential between developed and developing countries probably reflects differences in life expectancy, which is lower in developing countries.

In Latin America, pension-related issues include the budgetary implications of generous pension benefits, eroding payroll taxes, administrative waste and inequities in coverage and treatment. Unlike Europe and North America, pension reform in the region has generally been marked by a systemic approach and a movement away from pay-as-you-go systems. Most countries in the region are revamping or restructuring their systems by adopting a model which combines pay-as-you-go and privatized mandatory savings plans (United Nations, Economic Commission for Latin America and the Caribbean, 1997b). Nine countries have already implemented major reforms (Argentina, Bolivia, Chile, Colombia, Costa Rica, El Salvador, Mexico, Peru and Uruguay), while another six countries were considering pension reform, as of 1997 (Brazil, Ecuador, Guatemala, Panama, Paraguay and Venezuela) (United Nations, Economic Commission for Latin America and the Caribbean, 1996).

In Asia, with the exception of Japan, pension schemes are still in their infancy and reforms have generally not yet been pursued. In addition, several countries (Malaysia, Singapore and Thailand) have implemented fully funded schemes, which, unlike the pay-as-you-go pension schemes of Europe and North America, are less susceptible to demographic pressures. In East Asia, where ageing is most advanced, an expenditure increase of some 3 per cent of gross domestic product is projected by 2025, with

TABLE III.6. STANDARD RETIREMENT AGE, AROUND 1997
(*Percentage of countries*)

	Age					
	50-54	55-59	60-64	65 or above	Total	Number of countries
			More developed regions			
Males	0	0	49	51	100	51
Females	0	35	33	31	100	51
			Less developed regions			
Males	5	30	52	13	100	105
Females	9	44	42	6	100	105

Source: United States Social Security Administration, *Social Security Programs Throughout the World—1997* (Washington, D.C., 1997).

a further escalation of expenditures thereafter (Heller, 1997). China confronts a short- and long-term pension crisis. The immediate and urgent problem is in the State-owned enterprise sector. With the transition to a market economy, employment in State enterprises is shrinking, while the number of pensioners is growing. The long-term problem is driven by demographic forces. Due to rapid fertility decline and population ageing, the ratio of workers to pensioners is projected to fall sharply by 2050. To ease the burden on State firms, the Chinese Government announced in 1997 that individual employee retirement accounts would be established (International Social Security Administration, 1997).

In Africa, which is still at an early stage of the demographic transition, pension schemes are being redesigned to achieve good governance and extend coverage to the large informal sector.

4. *Health and long-term care*

Another sector where changing age structure poses challenges is in the area of health and long-term care. These expenditures are heavily concentrated among the older population, especially the oldest old (80 years and over), the fastest-growing segment of the older population. Age-cost profiles indicate that among developed countries per capita health expenditures for those aged 65 years and above are, on average, two-and-one-half to five times greater than for younger people. For those 75 years and older, the ratios are even higher (OECD, 1996a), while per capita nursing-home expenditures are up to 15 times higher than for the rest of the population in some countries. Some of the most costly chronic conditions, such as dementia, occur mainly in old age. Although the evidence is incomplete, women appear more susceptible than men to chronic illness and disability in later life.

Spurred by the significant increase in the oldest old population, the level of resources devoted to the care of frail older persons has risen dramatically. As a result, long-term care has been scrutinized more carefully in recent years and has led to the implementation of major reforms in this area. In some countries, reforms have entailed new forms of financing to meet long-term-care needs, while in others, delivery systems have been restructured to better match available resources to needs. These measures, many of which aim for cost containment, have concentrated on the supply of services, by expanding the number of nursing homes, as an alternative to hospital-based services, and the provision of day-care centres and respite-care facilities to enable the elderly to remain in their own homes or homes of family caregivers. In Japan, for example, a newly created insurance scheme will provide support for older persons in need of home nursing care and will be financed by taxing all those aged 40 years and above, beginning in the year 2000.

Projecting the future impact of ageing on health and long-term-care costs is hampered by the difficulty in predicting the evolution of health-care technology and productivity. If per capita treatment costs continue to rise faster than the gross domestic product, total health-care costs will be higher, even if there is no ageing effect. However, if per capita costs are capped below the rate of real gross domestic product growth, demographic pressure on health costs can to some extent be alleviated.

5. *Intergenerational transfers*

Intergenerational transfers are resource flows between members of families in different generations, both within and between households. These flows can take the form of direct transfer of money, the provision of services, shared living arrangements or any combination of the three. Since changes in age distribution alter the relative numbers of people on both sides of these flows—the number of children, the number of living parents and the number of living generations—demographic change can be expected to influence the magnitude and timing of these flows.

A related issue concerns generational accounting, a method to assess the intergenerational distribution of taxes and public transfer payments. Estimates for 17 low-fertility countries display a clear bias against future generations. As a consequence of ageing and the declining share of working-age population, relative to aged population, succeeding generations of workers will confront a growing tax burden, largely owing to current pension and health expenditures. This suggests that unless current generations pay more taxes or Governments decrease spending, succeeding generations will inherit dramatically higher rates of taxation, which may intensify intergenerational conflict (Kotlikoff and Leibfritz, 1997).

6. *Family structure and living arrangements*

The convergence of demographic and non-demographic trends, namely declining fertility, rising levels of divorce, remarriage and cohabitation, increases in female education and labour market activities, industrialization and urbanization have transformed family and household structures. The latter half of the twentieth century has been characterized by declining household size and an in-

creasing proportion of single person households (United Nations, 1995). While gains in life expectancy imply a greater potential for co-resident two-, three- and four-generation families, the percentage of older persons living with a child is rapidly decreasing in developed countries. In developing countries the dominant living arrangement for older persons continues to be co-residence with children and/or grandchildren.

At higher ages, living alone is primarily a female experience. Among European Union countries, 15 per cent of males over age 60 live alone, compared to 39 per cent for women in the same age group (van Solinge and others, 1998).

With the decline in kin availability due to lowered fertility, much attention has focused on the consequences of fewer potential caregivers. The consensus is of weakening family support for the elderly in developed and some developing countries, increasing the strains placed on formal support systems. Although single, widowed and divorced older persons are at greater risk of needing formal care arrangements, there is little evidence to support the claim that older persons with few children are disadvantaged (van Solinge and others, 1998).

Most countries, especially in developing regions, rely exclusively on the extended family—which usually means women—to care for older persons. Working women are particularly disadvantaged, as they often have the triple responsibility of labour market activities, child-rearing and caregiving to ageing parents. Countries have sought to bolster informal support systems by offering incentives for family caregivers. In Australia, Canada and New Zealand, low-cost prefabricated "granny flats" are available, while Malaysia and Singapore accord priority in public housing to adult children who live with their parents. Other countries offer programmes to provide home nursing care as an alternative to institutionalization, thereby relieving some of the financial pressures on public support programmes. It has been suggested that the challenge for developing countries is "to move toward formal systems of income maintenance without accelerating the decline in informal systems and without shifting more responsibility to government than it can handle" (World Bank, 1994).

7. *Socio-economic status of older persons*

The well-being of older persons is an important theme in recent discussions on the consequences of changing age structure. Although the socio-economic status of older persons has been enhanced by improvements in pension schemes, women are more likely than men to be poor. Women's lifetime earnings are substantially lower than those of men, because of shorter and more erratic labour-force participation, part-time employment, lower wages, smaller pensions or work in the informal sector. Furthermore, women's lower social status, weaker property rights and limited access to inheritance also influence their security in old age.

In countries with economies in transition, the shift to market economies has adversely affected most population groups, especially older persons living on fixed incomes. The situation is characterized by deteriorating health conditions and increases in unemployment, poverty and malnutrition (United Nations, 1997a). Recent measures introduced by several countries, such as pension indexing and increased social benefits, have brought some relief.

A related issue concerns the growing recognition that older persons can be assisted in leading a productive life by enlarging their income-generating potential and by employment training and placement. The need to expand opportunities for active ageing has been recognized at the highest levels of government. At the Denver Summit of the eight major industrialized countries in June 1997, the desire of many older persons to continue working or to be socially productive in later years was acknowledged. It was agreed that stereotypes of older persons as dependent should be abandoned and that active ageing should be promoted with due regard for individual choice and circumstances. Among the measures proposed were removing

BOX III.1 HOME ALONE? LIVING ARRANGEMENTS AND FAMILY SUPPORT AMONG THE ELDERLY IN ASIA

With smaller family size resulting from lowered fertility and rapid socio-economic development, which has increased education levels, precipitated the movement from agriculture to industry and services and fostered rural to urban migration, a major concern has been the impact of these changes on the traditional Asian pattern of older parents residing with one or more married children. Concerns for the well-being of older persons arise from the fact that they have had fewer educational opportunities, are likely to have engaged in strenuous agricultural work and to have suffered poor nutrition and other health risks in earlier life and have benefited less from socio-economic development. Based on a large body of recent comparative research in the region, a number of important findings have emerged. A major conclusion is that despite the substantial social, economic and political changes that have swept over the region, a high proportion of older persons reside with children or have children living nearby and that family members continue to provide financial, physical and material support to the elderly. Smaller but non-negligible proportions of parents also provide support to their children.

Source: A. Hermalin, "Drawing policy lessons for Asia from research on ageing"; J. Knodel and N. Debavalya, "Living arrangements and support among the elderly in South-east Asia: An introduction", *Asia-Pacific Population Journal* (Bangkok), vol. 12, No. 4 (1997) (ST/ESCAP/1834).

disincentives to labour-force participation, lowering barriers to flexible and part-time employment, promoting lifelong learning and voluntarism and supporting family caregiving (United Nations, 1997b).

8. *Conclusions*

There can be little doubt that changes in age distribution have complex social and economic implications at the societal and individual levels. An excess supply of workers could for instance turn into an acute shortage of new entrants within a few years. Likewise, the departure of older workers from the labour force is a source of serious pressure on national economies through its impact on pension schemes. An important issue is the question of how best to allocate limited resources among public sectors. Accordingly, planning may have to reflect greater sensitivity to expected demographic changes. This is especially important in the light of an increasingly competitive and integrated international economic environment, as well as a re-examination of the limitations of the welfare State. Conventional wisdom is that if change is slow, countries can more easily adapt. As the experience of developed countries has shown, despite an ageing process that has occurred over many years, adjustment to the challenges posed by population ageing has not been smooth. Given that large shifts in age structure are being compressed into a relatively short period in developing countries, these countries will have less time than developed countries to adapt to the problems posed by changing age structure.

On the individual level, the goal is to enable older persons to maintain their dignity, self-esteem and physical and mental well-being in order to facilitate their continued participation in society and recognize their valuable contribution to their families and communities. The challenge for countries and communities is to provide conditions that promote quality of life and enhance the ability of older persons to work and live independently as long as possible.

C. GOVERNMENT VIEWS AND POPULATION POLICIES

Population ageing is having profound effects on societies throughout the world. It is a quiet, almost unseen social revolution that is gradually gaining pace and will accelerate and become ever more evident in the next 25 years (World Health Organization, 1998). Its influence will be felt at every level, from family life and living arrangements, employment, the provision of health services and pension systems to the state of many national economies.

In coming years, the design and administration of government policies and programmes will be greatly affected by population ageing. The largest pressure on public finance in many countries will be from public pensions (OECD, 1996). Since pension costs will increase and will have to be borne by the younger generation, many Governments are seeking ways of making the necessary adjustments, to share the costs to the extent possible, and to put into place pension systems that are sustainable for future generations. In large numbers of countries, the effects of ageing on health-care costs are likely to be significant; moreover, in all countries, there are likely to be increased costs associated with dependent care for frail old people. In addition to developing public policies to mitigate the effects of population ageing on the labour market and social services, many Governments are developing policies that focus on the effects of ageing on individuals—helping people to stay active and self-reliant as they age (OECD, 1996).

For the first time, a question was asked in the Eighth United Nations Inquiry on Population and Development regarding Government's views on age structure and population ageing. The developed countries and some of the more advanced developing countries were most concerned with population ageing. Among the developed countries, Australia, Austria, Belarus, Belgium, Croatia, Germany, Greece, Romania, the Russian Federation, Slovakia and Yugoslavia all indicated that population ageing was a major concern. Among the developing countries, Armenia, Brazil, Costa Rica, Dominica, Ghana and the Republic of Korea indicated that population ageing was of major concern. A somewhat smaller number of developed countries, including Canada, Finland, Israel, Italy, Lithuania, Malta, New Zealand, Norway and Ukraine, reported that population ageing was of minor concern; a number of developing countries, including Bolivia, Burkina Faso, Colombia, Cuba, Ethiopia, Fiji, Guinea, Kuwait, Malaysia, the Philippines, Saudi Arabia, Turkey and Zambia also reported that population ageing was of minor concern. In contrast, several developing countries—Botswana, Djibouti, Malawi and Namibia—reported that population ageing was not an issue of concern; moreover, several other developing countries—Central African Republic, Morocco and Pakistan—reported that they had no official position in regard to population ageing.

In a number of countries in Eastern and South-eastern Asia, health and living standards have improved dramatically in recent decades. Sharp declines in fertility, combined with rising life expectancies, have resulted in rapid population ageing. In many of these countries, the elderly have traditionally relied on their children for personal care and financial support. However, today's old in Asia tend to have fewer children to care for them, and in many cases children have moved away to live at great distances from their parents. Co-residence is becoming less common in some Asian countries. Moreover, rising labour-force participation rates of middle-aged women in Asian countries have important implications for the ability of families to care for elderly relatives.

Singapore has adopted a comprehensive set of measures to respond to population ageing, including raising the retirement age from 55 to 60 and subsequently to 67 by 2003 and requiring workers who reach the age of 55 to set

aside greater amounts in their retirement accounts. To reduce the burden of care on the family, services such as home visiting, day care and respite care have been introduced; in addition, various public housing schemes have been implemented to encourage families of different generations to stay together (Asian Population and Development Association, 1997).

Most of China's elderly, especially in rural areas, still live with their families, and the Government encourages continuing family support. This has included writing an obligation of children to help support their parents into a 1996 law on the rights of the elderly and into another law on the rights of women. However, a boom in old-age homes, in spite of the traditional practice of parents staying with their children, is one of the more dramatic signs of China's population ageing. The Government is currently inviting individual investors and corporations to operate old-age and nursing homes to help meet a growing social need. Cities such as Guangxou, Shanghai and Beijing are expanding their public old-age homes, which house a mix of paying and welfare clients.

Retirement pension systems are also being established in Chinese cities. Moreover, rural insurance systems for the elderly are being experimented within the more economically developed areas of China, with some 1,000 counties in the country currently having established such systems. In addition, the Chinese People's Insurance Corporation has established long-term life-insurance and other old-age insurance schemes in rural areas as supplementary measures to the old-age social insurance scheme.

In the Republic of Korea, there has been an attempt to extend legal financial responsibility for long-term care to children. The Welfare and Health Law, which was passed in 1997, includes a provision that allows the heads of the facilities caring for the elderly to request that the patient's children pay the fees. Malaysia still views care of the elderly as a responsibility of the family; accordingly, the Government established a medical tax relief policy in 1992 for children caring for their elderly parents. In Thailand, government services for the elderly are quite limited, although efforts are being made to expand free medical care. In its latest official declaration on Long-Term Policies and Plans for the Elderly (covering 1992-2011), the Government of Thailand emphasized the responsibility of the family to provide assistance to elderly members. To date, only a small number of institutional residences have been established in Thailand for the elderly who are unable or unwilling to live with their families or on their own (Asian Population and Development Association, 1997).

The Japanese Government is seeking to shift some of the burden of caring for the elderly back to families and to the elderly themselves. In 1990, the Government launched a 10-year project called the Golden Plan which seeks to expand nursing-home capacity and to improve social services for the elderly who live at home. The plan calls for improvements in both day-care services and short-term stays in nursing homes to help families who are looking after elderly relatives at home.

A new law for long-term-care insurance will be implemented in Japan in the year 2000. A nursing care bill approved by the Japanese Diet in 1997 paves the way for the creation of a compulsory insurance system to cover nursing care for the elderly. The insurance system, to be established in April 2000, will provide support to assist elderly people in need of nursing care and to help households caring for elderly family members who are unwell. Under the scheme, all people aged 40 years of age or over will be obliged to pay a monthly premium from April 2000. The insurance system will provide for the dispatch of workers to households with ailing elderly people to provide care and support with housework; it also provides for rehabilitation assistance at care centres and short-term and long-term stays in nursing homes. Those who receive such services will be obliged to pay 10 per cent of total costs.

In regard to pension systems, in Japan, more than 80 per cent of retirees aged 60 and above receive public pension benefits. The Republic of Korea also has a public pension system with very broad coverage. Currently, the National Pension System covers workplaces with five or more employees and it was extended to rural areas in 1995. In addition, the Livelihood Protection Law guarantees a minimum standard of living and aims at enhancing the self-reliance capabilities of the elderly poor. Singapore and Malaysia also have strong pension systems. In contrast, in Indonesia, less than 20 per cent of the labour force is covered by public or private pension schemes. In Thailand, coverage is only about 10 per cent.

A number of Asian Governments have adopted policies to enhance employment opportunities for the elderly. In the Republic of Korea, the Elderly Job Bank Programme was begun in 1981, and 70 banks were being operated by local branch offices of the National Association of Senior Citizens as of 1997. The Employment Promotion Law enacted in the Republic of Korea in 1991 encourages business firms to hire 3 per cent or more of their employees from among the population aged 55 and over. In addition, this law stipulates that 40 jobs (e.g., selling bus tokens and cigarettes, attending parking lots and public parks) should be preferentially allocated to elderly persons (Chung, 1998). In Japan, the Employment Security Law for Older Workers (1986) provided for the establishment of Silver Human Resources Centres, which aim to provide older persons with temporary and short-term jobs closely connected with the daily life of their communities; grants are paid to employers who introduce a system for continued employment, and subsidies are available for preparing the workplace environment for employment of the elderly (Kojima, 1998).

In Central and Eastern Europe, most countries have faced an overhaul of their pension and health-care systems, together with the installation of new programmes of unemployment compensation and social safety nets. In Hungary, in 1993, the Social Welfare Act defined the

mandatory social welfare responsibilities at the local government level, including the provision of assistance to relatively healthy elderly persons living at home (home help for shopping, cleaning, etc.). Given the maze of newly emerging systems of public, private and voluntary sectors, the Government of Hungary has attempted to ensure the coordination and parallel operation of State, non-profit and private services by elaborating model experiments, restructuring the network of institutions in the State sphere and ensuring transferability of services. In Poland, the health status of the elderly seriously deteriorated in the course of the transition owing to the reduced availability of free medical services and the dismantling of the previous system of supplying medical drugs free to old-age pensioners. At present, a three-tier system is in operation: some basic life-saving drugs are available for a token fee, some are available at reduced prices, and some require full payment. Nursing homes and day-care facilities for the elderly, both public and private, are in operation, although in inadequate numbers. The general practice is that, upon admission, the pensioner pays his or her pension directly to the facility (United Nations, 1997a).

In the Russian Federation, territorial services for the delivery of urgent social aid for older persons in extreme situations are being developed. At "urgent aid" centres, older persons may receive services such as nutritional advice, lodging for a night free of charge, and a network of humanitarian aid which provides them with food provisions; there were more than 1,000 such entities in the Russian Federation at the beginning of 1994 (United Nations, 1997a).

In Europe as a whole, there are great disparities in existing pension and health insurance schemes. In Austria, the social security system has been adapted in order to guarantee the financial sustainability of the system in the long run. Whereas there will be no reduction in pension rights, the Government reports that there will be a slower rise in retirement benefits. Moreover, early retirement will be discouraged by a number of explicit disincentives. The Swiss social security system for the elderly depends on the level of lifetime income and is designed for lifetime marriages with traditional family roles. In Switzerland, basic health insurance has been compulsory since 1996. The premiums are the same for women and men, the young and the elderly; however, lower-income groups receive premium reductions (World Health Organization, 1995).

In Latin America, the dominant questions in regard to ageing have concerned the structure of pension schemes, with many countries studying the lessons of the well-publicized Chilean reforms. In Chile, in 1981 the social security system was changed from a government-run pay-as-you-go system to a privately managed contribution system. The new system basically consists of a mandatory savings programme managed by highly regulated private institutions and a mechanism that, upon a worker's retirement, converts the funds accumulated in the savings account into indexed annuities (United Nations, 1997b).

While there are few programmes for the elderly in the area of health in the Caribbean, some countries in the Caribbean, such as Barbados and Dominica, have non-governmental organizations (NGOs) referred to as national councils on ageing, which have broad-based community representation. Residences for the elderly are operated by non-governmental organizations throughout the Caribbean. Moreover, in a number of Caribbean countries, including Antigua and Barbuda, Barbados, Grenada and Jamaica, non-governmental organizations and churches are involved in providing care to shut-ins and offer health and social services, including activity centres and day-care centres (Pan American Health Organization, 1997). Cuba has developed an initiative known as *círculos de abuelos* (circles of grandparents), in which older persons look after children so that their parents can pursue their work. This scheme, which integrates older persons into society and utilizes their considerable social skills, now has more than 150,000 participants.

In Canada, despite the effectiveness to date of the key public pillars of Canada's income security system, the Old Age Security programme and the Canada Pension Plan, the Government reports that changes responsive to the ageing of the population are critical if protection and support are to be sustained. Measures have recently been taken in Canada to preserve and strengthen the income security system, to ensure it remains affordable, and to simplify the system and better target benefits. These measures include the introduction of a new Seniors Benefit, which will replace the existing Old Age Security programme, and reforms to the Canada Pension Plan. The Seniors Benefit will help target benefits to low- and middle-income seniors; will treat couples equally, will simplify the process of application and will make benefits non-taxable. Reforms to the Canada Pension Plan will ensure that this national social insurance programme is adapted gradually, in a phased manner, to meet the changing situations affecting both beneficiaries and contributors alike. Adequate levels of funding will be attained through a moderate increase in combined employer-employee contributions, and through a modest reduction in benefits for persons not yet over age 65. The Plan also includes special features which accommodate women's child-rearing responsibilities, longer lifespans and unique relationship to the labour market.

In the United States of America, the American Association of Retired Persons (AARP) has operated a number of work programmes for the elderly which utilize skills learned while working. Retraining programmes also exist for those who want to return to gainful employment. In regard to health care for the aged in the United States, starting in 1999, in addition to the original fee-for-service Medicare and health maintenance organizations, a

broader array of health plans will be able to join Medicare, including preferred provider organizations (PPOs), provider sponsored organizations (PSOs), private fee-for-service plans, and a Medical Savings Account demonstration project. These expanded health plan choices, known as Medicare+Choice, were created as part of the Balanced Budget Act of 1997. To assist Medicare beneficiaries in making decisions about their care, the Government is planning a comprehensive national information campaign designed to provide consumers with information about available plans, as well as answers to frequently asked questions. The campaign will include a national Internet site with comparative information on available plans. These options are expected to expand the choices available to Medicare beneficiaries, particularly in rural areas. It is expected that, by 2005, approximately 30 per cent of all Medicare beneficiaries in the United States will be enrolled in Medicare+Choice plans.

Recent reforms to the Australian health-care system have focused on improving the sustainability and efficiency of the acute-care sector, through such measures as improved incentives for private health insurance. Currently, all Australians are covered by the public health insurance scheme—Medicare—for medical and public hospital treatment. In regard to long-term care, the Australian Government has adopted a major package of structural reforms to long-term care which will put the system on a sustainable footing through the decades of population ageing ahead. These reforms build on a needs-based planning framework which has implemented a ratio of residential-care provision of 40 nursing-home places, 50 hostel places and 10 care-managed Community Aged Care Packages per thousand people aged 70 or over (Asian Population and Development Association, 1997). The Government also has been working with caregivers to improve assistance through such measures as the income-tested Carers Pension and the Domiciliary Nursing Home Benefit, which provide assistance for people caring at home for those with nursing-home-level care needs.

Australia provides a flat-rate non-contributory old-age pension for Australian residents, payable to men over 65 and women over 61 (with women's pension age being progressively raised to 65 in 2013). It is income and assets tested. Pensioners also receive additional assistance with pharmaceuticals and rent assistance if renting privately. In addition to the publicly provided old-age pension, Australia has a compulsory superannuation system which ensures that those in the labour force accumulate private savings for retirement (Asian Population and Development Association, 1997).

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IV. POPULATION DISTRIBUTION, URBANIZATION AND INTERNAL MIGRATION

A. LEVELS AND TRENDS OF INTERNAL MIGRATION

One of the major transformations characterizing the twentieth century has been the growth of urban centres and the rise of the proportion of people living in areas that can be characterized as urban. Yet the movement of people from rural to urban areas is only one of the possible forms of internal migration. Depending on the stage of urbanization, movements between rural areas or those between urban areas may be dominant. However, because rural-urban migration is one of the major demographic processes leading to the concentration of population in urban areas, attention has tended to focus almost exclusively on that type of migration.

Internal migration involves the movement from one place to another. A crucial issue in measuring the phenomenon is therefore the need to identify different "places". Normally, existing administrative units within a country are used as the basic geographical areas that allow the distinction between migrants and other movers to be made. Given that administrative units vary in size both within and between countries, perfect international comparability cannot be assured. There are also differences between countries about the time reference used in order to consider that a movement from one place to another is an internal migration. Censuses, which are the data-collection instruments most commonly used to gather information about internal migration in developing countries, tend to use three different approaches to identify migrants: (*a*) as persons who at the time of the census live in an administrative unit different from that in which they were born; (*b*) as persons who at the time of the census live in an administrative unit different from that in which they lived at some fixed time before the census (usually five years before the census date); and (*c*) as persons who report that they have changed place of residence without necessarily specifying when the change took place. This section will use the limited data available on internal migration in developing countries to assess its relative importance, the degree of participation of women in that process, and the comparative significance of different types of flows. Then, using intercensal estimates of net rural-urban migration, the impact that it has had on the urbanization process of developing countries will be discussed. Lastly, a review will be made of the results of studies of internal migration in developed countries and its changing significance for the growth of urban centres.

1. *Internal migration in the less developed regions*

Table IV.1 presents the total number of internal migrants by sex as identified by the censuses or surveys carried out in developing countries since 1980. The table includes all countries for which the requisite data could be obtained. As indicated in the table, the types of geographical units used by the different countries to identify internal migrants vary. In some cases, the smallest unit (the district) was used, whereas in others, higher-level units (states) were the basis for identification. For a number of countries, information on the type of unit used was not specified or was presented in terms that remained ill-defined, such as "region" or "zone". In total, information could be obtained for 15 countries, five in each of the major areas. For each country, the table displays the number of migrants by sex, the percentage of women among migrants, and the percentage of migrants among the survivors of the population at risk of migrating. The number of survivors used depends on the method adopted to identify migrants. If migrants are identified in terms of their place of birth, the total population as enumerated at the time of the census is used as denominator. If migrants are identified as persons having a different place of residence than the one they had five years before the census, the population used as denominator consists of all persons aged five or older.

There are marked differences in the internal migration experience of the five African countries considered. In Sierra Leone and Zimbabwe, about one in every four persons changed place of residence at least once since birth. In both countries, the likelihood of a woman having migrated is lower than that of men and the majority of migrants are men, especially in the case of Sierra Leone where women account for a low 43 per cent of all internal migrants. In Ethiopia and Northern Sudan, lifetime migrants account for about a tenth of the population but, whereas in Northern Sudan, women are slightly less prone to migrate than men, in Ethiopia women appear to be slightly more likely to migrate than men, especially with regard to intra-region migration. In Northern Sudan, women account for 45 per cent of all internal migrants whereas in Ethiopia they outnumber men among the totality of migrants. In Cape Verde, women are more numerous than men among migrants settled in urban areas but less numerous among migrants settled in rural areas.

Among Asian countries, Thailand registers the highest proportion of migrants among the total population (about

TABLE IV.1. INTRA-STATE AND INTER-STATE MIGRANTS BY SEX, SELECTED DEVELOPING COUNTRIES

Country	*Census year*	*Type of migration according to time criterion used*	*Type of migration according to geographical units used*	*Male migrants (thousands)*	*Female migrants (thousands)*	*Percentage female*	*Percentage of migrants among the male population*[a]	*Percentage of migrants among the female population*[a]
			A. *Africa*					
Cape Verde	1990	Residence in 1985	Urban residence in 1990	5.8	6.8	54.1	5.6	5.5
Cape Verde	1990	Residence in 1985	Rural residence in 1990	1.9	1.9	48.4	1.8	1.5
Ethiopia	1984	Place of birth	Intra-region	1 727.5	2 173.7	55.7	10.0	12.6
Ethiopia	1984	Place of birth	Intra-zone	291.6	321.8	52.5	1.7	1.9
Ethiopia	1984	Place of birth	Inter-zone	563.3	565.9	50.1	3.3	3.3
Sierra Leone	1974	Place of birth	Not specified	332.3	255.7	43.5	25.3	18.9
Sierra Leone	1985	Place of birth	Not specified	371.1	277.6	42.8	27.3	20.2
Sudan (Northern)	1993	Place of birth	Inter-state	1 389.8	1 118.5	44.6	13.1	10.7
Zimbabwe	1992	Place of birth	Inter-state	1 316.1	1 307.7	49.8	27.3	25.5
Zimbabwe	1992	Residence in 1982	Inter-state	645.3	642.9	49.9	19.0	17.8
			B. *Asia*					
Brunei Darussalam	1991	Residence in 1986	Inter-district	11.9	10.0	45.5	12.4	11.0
Nepal	1991	Residence in 1990	Not specified	46.3	44.8	49.2	0.5	0.5
Thailand	1990	Place of birth	Inter-state	3 681.6	3 591.2	49.4	13.6	13.0
Thailand	1990	Residence in 1985	Intra-state	633.7	509.6	44.6	2.6	2.0
Thailand	1990	Residence in 1985	Inter-state	1 350.2	1 230.8	47.7	5.4	4.9
Thailand	1994	Place of birth	Inter-state	5 430.2	5 399.2	49.9	18.4	18.0
Turkey	1990	Residence in 1985	Intra-district	709.6	628.2	47.0	2.8	2.5
Turkey	1990	Residence in 1985	Inter-district	2 255.5	1 809.7	44.5	8.8	7.2
Viet Nam	1989	Residence in 1984	Inter-district	471.8	500.7	51.5	1.8	1.8
Viet Nam	1989	Residence in 1984	Inter-province	817.8	611.5	42.8	3.2	2.1

TABLE IV.1 (*continued*)

Country	Census year	Type of migration according to time criterion used	Type of migration according to geographical units used	Male migrants (thousands)	Female migrants (thousands)	Percentage female	Percentage of migrants among the male population[a]	Percentage of migrants among the female population[a]
			C. *Latin America*					
Mexico	1990	Place of birth	Inter-state	6 716.3	7 259.9	51.9	16.8	17.6
Mexico	1990	Residence in 1985	Inter-state	1 701.6	1 775.6	51.1	4.9	4.9
Panama	1990	Place of birth	Inter-state	247.3	261.2	51.4	20.1	22.0
Panama	1990	Residence in 1985	Inter-state	61.1	61.1	50.0	5.7	5.9
Saint Lucia	1991	Place of birth	Not specified	15.0	17.1	53.3	24.2	26.0
Trinidad and Tobago	1990	Place of birth	Not specified	131.8	154.6	54.0	20.2	28.3
Trinidad and Tobago	1990	Residence in 1985	Not specified	117.1	138.3	54.1	20.1	27.3
Venezuela	1990	Place of birth	Inter-state	1 992.7	2 083.2	51.1	22.1	22.9

Sources: Brunei Darussalam: *Report on the 1991 Population Census* (Bandar Seri Begawan, Economic Planning Unit, Statistics Division, n.d.), p. 39, table 5.3; Cape Verde: *Censos 90: Recenseamento Geral da Populacão e Habitacão* (Direcão-Geral de Estatistica, 1992), p. 39, table 1.10; Ethiopia: *The 1984 Population and Housing Census of Ethiopia: Analytical Report at National Level* (Addis Ababa, Transitional Government of Ethiopia, Office of the Population and Housing Census Commission, 1991), p. 246, table 4.15; Makannah, Toma J., ed., *Handbook of the Population of Sierra Leone* (Toma Enterprises Ltd., n.d.), p. 136, table 5.1 and p. 137, table 5.2; Mexico: *Estados Unidos Mexicanos: Resumen General, XI Censo General de Población y Vivienda, 1990* (Mexico City, Instituto Nacional de Estadística, Geografía e Informática, n.d.), p. 28, table 4 and p. 35, table 5; Nepal: *Population Census 1991(Kathmandu,* Central Bureau of Statistics, 1993), p. 6, table 4 and p. 14, table 10; Panamá: *Censos Nacionales de Población y Vivienda: Resultados finales ampliados* (Panamá, Contraloría General de la República, Dirección de Estadística y Censo, 1991), vol. 1, p. 14, table 1, vol. 2, p. 12, table 1 and vol. 2, p. 34, table 2; Saint Lucia: *1991 Population and Housing Census, vol. I: National Population Trend* (Castries, Ministry of Finance, Statistics Department, 1994), vol. 1, p. 3 and vol. 4, p. 31, table 1; Sudan: *Fourth Population Census of Sudan: Report of the Advance Census Results* (Khartoum, Department of Statistics, Census Office, 1995), p. 98, table 5; Thailand: *1990 Population and Housing Census: Whole Kingdom* (Bangkok, Office of the Prime Minister, National Statistical Office, n.d.), p. 40, table 9 and p. 44, table 10; Report of the Migration Survey 1994 (Bangkok, Office of the Prime Minister, National Statistical Office, n.d.), p. 43, table 10 and p. 44, table 11; Trinidad and Tobago: *1990 Population and Housing Census, vol. IV* (Port-of-Spain, Office of the Prime Minister, Central Statistical Office, n.d.), p. 1, table 1, p. 36, table 6, p. 174, table 11, p. 176, table 12 and p. 178, table 13; Turkey: *1990 Census of Population: Social and Economic Characteristics of Population* (Ankara, Prime Ministry, State Institute of Statistics, n.d.), p. 8, table 1; 1990 Census of Population: Social and Economic Characteristics of Internal Migration by Permanent Residence (Ankara, Prime Ministry, State Institute of Statistics, n.d.), p. 10, table 7 and p. 12, table 8; Venezuela: *El Censo 90 en Venezuela* (Caracas, Oficina Central de Estadística e Informática (OCEI), 1993), p. 36, table 5; Viet Nam: *Vietnam Population Census 1989: Completed Census Results,* vol. 1 (Hanoi, n.d.), p. 145, table 2.2; Zimbabwe: *Census, 1992; Zimbabwe National Report* (Harare, Central Statistical Office, 1994), p. 42, table 3.2.b and p. 42, table 3.2.c.

[a]The population used is the total population if lifetime migration is involved and it is the population aged x and over if migrants are identified in terms of place of residence at time t-x, where t is the time of census or survey enumeration.

18 per cent in 1994), but that proportion is considerably lower than those reported in Sierra Leone or Zimbabwe. The fact that most countries in Asia tend to use the place of residence at some pre-specified time in the past to identify migrants contributes to reducing the proportion of migrants recorded. Nevertheless, it appears that Viet Nam experienced particularly low internal mobility during 1984-1989, involving a low 2.6 per cent of the population aged 5 or over. For Nepal the low values reported are due to the short time-span considered, 1990-1991, and would probably surpass those registered in Viet Nam if the full five-year period had been used instead. Regarding the participation of women in internal migration, their propensity to move was generally lower than that of men and male migrants outnumbered female migrants in every case except among inter-district migrants in Viet Nam. Especially low proportions of women among all migrants were registered in Brunei Darussalam, Thailand and Turkey.

In Latin America and the Caribbean the proportion of lifetime migrants tended to be higher, varying between 16 and 25 per cent. Even when migrants were identified in terms of their place of residence five years before the census, their proportion was significant. In Mexico, for instance, about 5 per cent of the population aged 5 or over changed residence from one state to another during the period 1985-1990. As is well known, internal migration in Latin America is characterized by female migrants generally outnumbering male migrants. That is the case for the five Latin American countries included in table IV.1. Particularly high proportions of female migrants were common in the Caribbean countries (Saint Lucia and Trinidad and Tobago).

Although the overall number of migrants provides information on the propensity to migrate, it does not inform about the impact of internal migration on population redistribution. Data providing information about the directionality of flows are needed for the latter purpose. Table IV.2 presents the information available regarding the distribution of migrants according to the different types of flow: rural-urban, urban-urban, rural-rural and urban-rural. Because of the importance of the urbanization process and its strong linkages to development, the analysis of internal migration in developing countries has often been circumscribed to the consideration of rural-urban migration. Yet, as the data presented in table IV.2 indicate, for most of the countries with data available, rural-urban migration does not account for the largest proportion of internal movements. Indeed, in countries that are still largely rural, rural-rural migration is likely to be more important than rural-urban migration (as in Ethiopia, India and Thailand); whereas in countries that are highly urbanized, urban-urban migration will dominate (as in Brazil, Brunei Darussalam, Peru and in the Republic of Korea in the 1990s). Even in countries with moderate levels of urbanization, urban-urban migration may be significant, as in Côte d'Ivoire in 1986, Ghana in 1988, Egypt in 1976, Pakistan in 1973, and Honduras in 1983. That is, although rural-urban migration and its counterpart, urban-rural migration, deserve attention because they contribute to redistribution of population between urban and rural areas, at certain stages of the urbanization process the other types of migration (rural-rural and urban-urban) may be more important in the redistribution of population within each geographical strata. Unfortunately, as table IV.2 indicates, the number of countries that have consistently gathered information allowing an assessment of the different types of flows is limited and, even when the data exist for different points in time, changes in the definition of urban and rural areas may lead to a lack of consistency over time. In the case of the Republic of Korea, for instance, although the general trends implied by the census data presented in table IV.2 are indicative of true changes over time, the data need to be adjusted to take account of modifications in the way the data were tabulated. Properly adjusted data, as displayed in table IV.3, show that the weight of rural-urban migration did not decline as markedly as the unadjusted data suggest and that, although urban-urban migration became dominant by 1985-1990, its relative weight was not as high as indicated by the unadjusted data. Problems such as these are likely to arise in other cases and, because the derivation of adjusted estimates requires access to highly disaggregated data and an in-depth knowledge of the classification changes made, they are often not feasible on the basis of the typical tabulations published on the basis of census data.

The country examples presented here show that the participation of women varies by type of flow. Thus, in Egypt and India, for instance, the participation of women tends to be more marked in flows directed towards rural areas, especially in rural-rural migration. In contrast, in Brazil, Honduras, the Philippines and Thailand, the participation of women has been considerably more marked among flows directed to urban areas, be they rural-urban or urban-urban. Furthermore, women have tended to outnumber men by wide margins in those particular flows.

As this overview illustrates, it is not possible to provide a comprehensive view of either levels or trends of internal migration in developing countries because few countries gather and publish on a consistent basis the data required to make such an assessment. The data available indicate a variety of migration levels within all major areas of the developing world, with the propensity to migrate being higher among the countries of Latin America and the Caribbean than among those of Asia. With regard to the participation of women in internal migration, there is also substantial variation within major areas, although the countries of Latin America and the Caribbean tend to be characterized by higher proportions of women among migrants than are other developing areas.

TABLE IV.2. MIGRANTS, BY SEX AND TYPE OF FLOW, ACCORDING TO URBAN OR RURAL ORIGIN OR DESTINATION

(Number of migrants in thousands)

Country and type of data	*Census year*	*Migration stream*	*Both sexes*	*Male*	*Female*	*Percentage female*
Africa						
Botswana	1985	Rural-urban	60.0	..	..	..
Place of birth		Urban-urban	8.0	..	..	..
		Rural-rural	29.0	..	..	..
		Urban-rural	3.0	..	..	..
		Total migrants	..	..	..	..
Côte d'Ivoire	1986	Rural-urban	14.8	..	..	..
Previous residence		Urban-urban	44.2	..	..	..
		Rural-rural	20.3	..	..	..
		Urban-rural	20.7	..	..	..
		Total migrants	..	..	..	..
Ghana	1988	Rural-urban	4.6	..	..	..
Previous residence		Urban-urban	48.5	..	..	..
		Rural-rural	9.5	..	..	..
		Urban-rural	37.3	..	..	..
		Total migrants	..	..	..	..
Egypt	1976	Rural-urban	26.0	27.8	24.1	46.3
Inter-state		Urban-urban	55.2	56.9	53.5	48.3
Previous residence		Rural-rural	12.0	8.9	15.1	62.9
		Urban-rural	6.8	6.4	7.2	52.7
		Total migrants	5 070	2 544	2 527	49.8
Ethiopia	1984	Rural-urban	28.7	..	..	..
Place of birth		Urban-urban	13.5	..	..	..
		Rural-rural	55.8	..	..	..
		Urban-rural	2.0	..	..	..
		Total migrants	5 643.8	..	..	..
Sierra Leone, 1974	1974	Rural-urban	25.5	..	..	..
Place of birth		Urban-urban	27.7	..	..	..
		Rural-rural	25.3	..	..	..
		Urban-rural	21.5	..	..	..
		Total migrants	588.0	..	..	..
Sudan (Northern)	1993	Rural-urban	34.4	..	..	..
Place of birth		Urban-urban	41.7	..	..	..
		Rural-rural	16.6	..	..	..
		Urban-rural	7.3	..	..	..
		Total migrants	2 508.3	..	..	..
Asia						
Brunei Darussalam, 1991	1991	Rural-urban	18.2	..	..	..
Residence in 1986		Urban-urban	53.9	..	..	..
		Rural-rural	9.7	..	..	..
		Urban-rural	18.3	..	..	..
		Total migrants	47.1	..	..	..

TABLE IV.2 (*continued*)

Country and type of data	*Census year*	*Migration stream*	*Both sexes*	*Male*	*Female*	*Percentage female*
India	1971	Rural-urban	12.8	21.6	9.3	52.1
Intra-state		Urban-urban	7.7	13.1	5.6	52.3
Place of birth		Rural-rural	73.9	57.8	80.2	77.8
		Urban-rural	5.6	7.5	4.9	62.5
		Total migrants	140 269	39 682	100 587	71.7
India	1971	Rural-urban	28.4	35.2	21.4	36.8
Inter-state		Urban-urban	30.7	32.7	28.6	45.7
Place of birth		Rural-rural	32.9	24.0	42.2	62.8
		Urban-rural	8.0	8.1	7.9	48.2
		Total migrants	18 393	9 384	9 009	49.0
India	1971	Rural-urban	14.6	24.2	10.3	48.6
Total		Urban-urban	10.4	16.8	7.5	50.0
Place of birth		Rural-rural	69.1	51.4	77.1	77.0
		Urban-rural	5.9	7.6	5.2	60.2
		Total migrants	158 662	49 066	109 596	69.1
India	1981	Rural-urban	14.7	24.9	10.9	53.7
Intra-state		Urban-urban	9.4	15.6	7.1	54.7
Place of birth		Rural-rural	70.0	52.0	76.8	79.7
		Urban-rural	5.9	7.5	5.2	64.8
		Total migrants	177 887	48 627	129 260	72.7
India	1981	Rural-urban	31.5	39.2	24.5	40.7
Inter-state		Urban-urban	31.2	33.4	29.2	48.9
Place of birth		Rural-rural	29.5	20.0	38.2	67.8
		Urban-rural	7.7	7.4	8.1	54.7
		Total migrants	23 185	11 044	12 141	52.4
India	1981	Rural-urban	16.7	27.6	12.1	50.9
Total		Urban-urban	11.9	18.9	9.0	53.0
Place of birth		Rural-rural	65.4	46.0	73.5	79.1
		Urban-rural	6.1	7.5	5.5	63.3
		Total migrants	201 072	59 671	141 401	70.3
Malaysia	1970	Rural-urban	8.8	8.9	8.7	46
Residence in 1965		Urban-urban	20.0	20.6	19.3	45
		Rural-rural	38.8	38.5	39.2	47
		Urban-rural	32.4	32.1	32.7	47
		Total migrants	904	484	421	46.5
Pakistan	1973	Rural-urban	17.3	18.0	16.3	42.3
Residence in 1965		Urban-urban	38.8	39.0	38.4	44.2
		Rural-rural	32.6	30.2	35.5	48.7
		Urban-rural	11.4	12.7	9.7	38.1
		Total migrants	2 054	1 137	917	44.6
Philippines	1973	Rural-urban	39.3	35.0	42.6	60.6
Residence in 1965		Urban-urban	25.2	25.5	25.1	55.5
		Rural-rural	19.7	22.4	17.5	49.8
		Urban-rural	15.8	17.0	14.8	52.5
		Total migrants	2 997	1 321	1 676	55.9
Philippines	1973	Rural-urban	43.5	42.5	44.4	52.2
Birth to 1965		Urban-urban	12.8	11.4	14.0	56.2
		Rural-rural	32.6	35.0	30.3	47.5
		Urban-rural	11.2	11.1	11.3	51.6
		Total migrants	4 864	2 376	2 487	51.1

TABLE IV.2 (*continued*)

Country and type of data	*Census year*	*Migration stream*	*Both sexes*	*Male*	*Female*	*Percentage female*
Republic of Korea	1966	Rural-urban	36.6	36.7	36.6	52.6
Residence in 1961		Urban-urban	32.0	32.0	31.9	52.6
		Rural-rural	21.2	20.8	21.6	53.6
		Urban-rural	10.2	10.4	10.0	51.6
		Total migrants	2 493	1 179	1 314	52.7
Republic of Korea	1970	Rural-urban	48.6	47.8	49.4	51.5
Residence in 1965		Urban-urban	23.9	24.5	23.2	49.3
		Rural-rural	17.2	17.0	17.5	51.3
		Urban-rural	10.3	10.7	9.9	48.7
		Total migrants	3 761	1 856	1 905	50.6
Republic of Korea	1975	Rural-urban	43.5	42.7	44.2	54.1
Residence in 1970		Urban-urban	28.7	29.2	28.3	52.4
		Rural-rural	14.0	14.1	13.9	52.8
		Urban-rural	13.8	14.0	13.7	52.7
		Total migrants	4 033	1 886	2 147	53.2
Republic of Korea	1990	Rural-urban	25.7	23.6	23.9	51.6
Residence in 1985		Urban-urban	70.3	65.0	64.9	51.2
		Rural-rural	4.1	3.8	3.7	51.1
		Urban-rural	8.2	7.6	7.5	51.0
		Total migrants	9 816.0	4 784.1	5 031.9	51.3
Republic of Korea	1995	Rural-urban	12.8	12.0	11.9	50.6
Residence in 1990		Urban-urban	85.7	80.0	80.3	51.0
		Rural-rural	1.5	1.4	1.4	51.2
		Urban-rural	7.0	6.7	6.4	49.9
		Total migrants	10 024.5	4 926.6	5 097.8	50.9
Thailand	1980	Rural-urban	15.4	13.6	17.3	53.7
Residence in 1975		Urban-urban	18.5	17.1	20.0	51.6
		Rural-rural	56.0	58.6	53.1	45.3
		Urban-rural	10.2	10.6	9.7	45.5
		Total migrants	2 738	1 430	1 308	47.8
Thailand	1994	Rural-urban	15.0	..	..	..
Residence in 1992		Urban-urban	7.0	..	..	..
		Rural-rural	44.1	..	..	..
		Urban-rural	33.9	..	..	..
		Total migrants	..	..	..	..
Latin America and the Caribbean						
Bolivia	1992	Rural-urban	71.4	..	..	..
Place of birth		Urban-rural	28.6	..	..	..
		Total migrants	767.4	..	..	..
Residence in 1987		Rural-urban	61.0	..	..	..
		Urban-rural	39.0	..	..	..
		Total migrants	235.7	..	..	..
Brazil	1970	Rural-urban	17.9	17.5	18.4	51.4
Inter-district		Urban-urban	50.4	48.6	52.2	51.9
Place of birth		Rural-rural	25.7	27.4	23.9	46.7
		Urban-rural	6.0	6.6	5.5	45.8
		Total migrants	30 260	15 105	15 155	50.1

TABLE IV.2 (*continued*)

Country and type of data	Census year	Migration stream	Both sexes	Male	Female	Percentage female
Brazil	1970	Rural-urban	17.4	17.1	17.8	49.9
Inter-state		Urban-urban	50.4	48.6	52.4	50.7
Place of birth		Rural-rural	26.5	28.2	24.6	45.4
		Urban-rural	5.7	6.2	5.1	43.9
		Total migrants	14 427	7 392	7 035	48.8
Ecuador	1982	Rural-urban	16.0	..	..	..
Previous residence		Urban-urban	46.0	..	..	..
		Rural-rural	18.0	..	..	..
		Urban-rural	21.0	..	..	..
		Total migrants	..	..	..	..
Ecuador	1990	Rural-urban	39.6	..	..	..
Place of birth		Urban-rural	60.4	..	..	..
		Total migrants	1 039.5	..	..	..
Residence in 1985		Rural-urban	50.5	..	..	..
		Urban-rural	49.5	..	..	..
		Total migrants	330.7	..	..	..
Honduras	1983	Rural-urban	26.0	20.9	29.8	65.3
Residence in 1978		Urban-urban	32.0	29.3	34	60.5
		Rural-rural	28.2	33.5	24.1	48.7
		Urban-rural	13.9	16.3	12.1	49.5
		Total migrants	3	1	2	56.9
Peru	1986	Rural-urban	11.6	..	..	..
Previous residence		Urban-urban	51.6	..	..	..
		Rural-rural	13.6	..	..	..
		Urban-rural	23.2	..	..	..
		Total migrants	..	..	..	..

Sources: Brunei Darussalam: *Report on the 1991 Population Census* (Bandar Seri Begawan, Economic Planning Unit, Statistics Division, n.d.), p. 39, table 5.3; Cape Verde: *Censos 90: Recenseamento Geral da Populacão e Habitacão* (Direcão-Geral de Estatistica, 1992), p. 39, table 1.10; Ethiopia: *The 1984 Population and Housing Census of Ethiopia: Analytical Report at National Level* (Addis Ababa, Transitional Government of Ethiopia, Office of the Population and Housing Census Commission, 1991), p. 246, table 4.15; Makannah, Toma J. ed., *Handbook of the Population of Sierra Leone* (Toma Enterprises Ltd., n.d.), p. 136, table 5.1 and p. 137, table 5.2; Mexico: *Estados Unidos Mexicanos: Resumen General, XI Censo General de Población y Vivienda, 1990* (Mexico City, Instituto Nacional de Estadística, Geografía e Informática, n.d.), p. 28, table 4 and p. 35, table 5; Nepal: *Population Census 1991* (Kathmandu, Central Bureau of Statistics, 1993), p. 6, table 4 and p. 14, table 10; Panamá: *Censos Nacionales de Población y Vivienda: Resultados finales ampliados* (Panamá, Contraloría General de la República, Dirección de Estadística y Censo, 1991), vol. 1, p. 14, table 1, vol. 2, p. 12, table 1 and vol. 2, p. 34, table 2; Saint Lucia: *1991 Population and Housing Census*, vol. 1: *National Population Trend* (Castries, Ministry of Finance, The Statistics Department, 1994), vol. 1, p. 3 and vol. 4, p. 31, table 1; Sudan: *Fourth Population Census of Sudan: Report of the Advance Census Results* (Khartoum, Department of Statistics, Census Office, 1995), p. 98, table 5; Thailand: *1990 Population and Housing Census: Whole Kingdom* (Bangkok, Office of the Prime Minister, National Statistical Office, n.d.), p. 40, table 9 and p. 44, table 10; *Report of the Migration Survey 1994* (Bangkok, Office of the Prime Minister, National Statistical Office, n.d.), p. 43, table 10 and p. 44, table 11; Trinidad and Tobago: *1990 Population and Housing Census*, vol. IV (Port-of-Spain, Office of the Prime Minister, Central Statistical Office, n.d.), p. 1, table 1, p. 36, table 6, p. 174, table 11, p. 176, table 12 and p. 178, table 13; Turkey: *1990 Census of Population: Social and Economic Characteristics of Population* (Ankara, Prime Ministry, State Institute of Statistics, n.d.), p. 8, table 1; *1990 Census of Population: Social and Economic Characteristics of Internal Migration by Permanent Residence* (Ankara, Prime Ministry, State Institute of Statistics, n.d.), p. 10, table 7 and p. 12, table 8; Venezuela: *El Censo 90 en Venezuela* (Caracas, Oficina Central de Estadística e Informática (OCEI), 1993), p. 36, table 5; Viet Nam: *Vietnam Population Census 1989: Completed Census Results*, vol. 1 (Hanoi, n.d.), p. 145, table 2.2; Zimbabwe: *Census, 1992; Zimbabwe National Report* (Harare, Central Statistical Office, 1994), p. 42, table 3.2.b and p. 42, table 3.2.c.

NOTE: The population used is the total population if lifetime migration is involved and it is the population aged x and over if migrants are identified in terms of place of residence at time t-x, where t is the time of census or survey enumeration.

2. *Rural-urban migration as a component of urban growth*

Rural to urban migration is often viewed as the main cause of urban growth. However, the urban and rural populations of a country can change as a result of births, deaths, migration and areal reclassification resulting from changes of the boundaries defining urban and rural areas. Identifying the contribution of each of these components to urban and rural population change is fundamental for the study of the urbanization process, particularly in developing countries, where the pace of urban growth may

TABLE IV.3. INTERDISTRICT MIGRANTS BY TYPE OF MIGRATION FLOW AND PERIOD OF MIGRATION, REPUBLIC OF KOREA, 1961 TO 1990

Migration type	Migration period					
	1961-1966	1965-1970	1970-1975	1975-1980	1980-1985	1985-1990
Rural-urban	37.6	50.7	44.3	46.9	39.3	33.6
Urban-urban	28.9	20.7	27.4	30.1	38.6	50.4
Rural-rural	21.8	18.0	14.2	10.4	7.6	5.4
Urban-rural	11.7	10.7	14.1	12.7	14.4	10.7
Total migrants (thousands)	2 429	3 593	3 962	5 382	6 161	6 969
Population aged 5 and over (thousands)	24 679	27 119	30 452	33 612	36 717	40 302
Percentage of migrants	9.8	13.2	13.0	16.0	16.8	17.3

Source: Economic and Social Commission for Asia and the Pacific, "Migration and urbanization in Asia and the Pacific: Interrelations with socio-economic development and evolving policy issues", Selected Papers of the Pre-Conference Seminar, Fourth Asian and Pacific Population Conference, Seoul, 21-25 January 1992, Asian Population Studies Series, No. 111 (ST/ESCAP/1153), p. 65.

pose serious challenges for those in charge of planning and formulating economic and social policy.

Estimates of the components of urban growth have been derived by the United Nations Population Division on the basis of information from consecutive censuses regarding the distribution of the population by place of residence (urban vs. rural), age group and sex using the census survival method.[1] The components of urban growth were estimated for 36 developing countries in the 1960s, 41 in the 1970s and 27 in the 1980s. For Africa, estimates could be obtained in 17 cases, but for nine countries only one decade was covered, making it impossible to obtain clear trends for the region. For Latin America, in contrast, estimates for at least two decades could be obtained for almost all the countries in the region. In Asia, estimates could be calculated for 16 countries, including the most populous ones—Bangladesh, China, India, Indonesia and Pakistan—although only one decade was covered for China and Pakistan. Given the limited availability of data, this assessment of trends since 1960 can only be considered tentative although it is based on the most complete picture available to date of the relative impact of net rural-urban migration and reclassification of areas from rural to urban on urban population growth.

Table IV.4 presents a summary of the main estimates obtained. There is considerable variability in the percentage of urban growth attributable to the combination of net rural-urban migration and reclassification.[2] For the 1960s, estimates vary from 9 to 77 per cent, and for the 1970s the range of variation is from 13 to 66 per cent. The median value of the estimates obtained remains nearly unchanged over the three decades covered at a level of about 40 per cent of urban growth attributable to net rural-urban migration. However, given the different coverage of countries from one decade to the next and the fact that countries of very different population sizes are being considered within each decade, the median may not be the best indicator of the relevance of migration and reclassification.

Another way of assessing the relative impact of natural increase vs. net rural-urban migration on urban population growth at the level of major areas is by using appropriate weights to aggregate country estimates. Thus, the estimates of net rural-urban migration may be weighted by the size of the rural population to obtain a weighted estimate of the number of rural out-migrants during the intercensal period. Similarly, the estimates of urban natural increase may be weighted by the size of the urban population to obtain the net gain of births over deaths. Aggregation by region produces the estimates presented in table IV.5, which imply that the three major regions have experienced different trends in the rate of natural increase and net rural out-migration rates. The most reliable estimates are those for Latin America and the Caribbean, where there are more countries having data for each decade. They show a continuous decline of the rate of natural increase from one decade to the next. For Asia, the estimated rate of natural increase of urban areas is nearly the same for the 1960s and 1970s, but declines markedly in the 1980s. This trend results from the fact that China is only included in the 1980s and masks the true trend of the rest of the continent. For that reason, estimates for Asia that exclude China are also presented. They show that the urban rate of natural increase rose slightly over the three decades considered. A similar trend is observed in Africa, whose estimates are the weakest because of the varying groups of countries with data for each decade. The estimates of the rate of natural increase in the urban areas of Africa can be conservatively interpreted as indicating that its levels are high and have varied little from the 1960s to the 1980s. For the developing world as a whole, the urban rate of natural increase declines moderately if China is excluded and markedly otherwise.

TABLE IV.4. ESTIMATES OF THE COMPONENTS OF URBAN GROWTH

	Annual intercensal growth rate of urban areas			*Annual urban rate of natural increase*			*Annual rate of urban growth from internal migration/reclassification*			*Proportion of urban growth attributable to internal migration/reclassification (percentage)*		
	1960s	*1970s*	*1980s*	*1960s*	*1970s*	*1980s*	*1960s*	*1970s*	*1980s*	*1960s*	*1970s*	*1980s*
Africa												
Eastern Africa												
Kenya	..	7.9	..	..	3.4	..	..	4.5	..	..	57.4	..
United Rep. of Tanzania	..	12.6	..	..	4.8	..	..	7.8	..	..	61.9	..
Zimbabwe	..	5.4	5.9	..	2.2	2.9	..	3.3	3.0	..	60.0	50.7
Northern Africa												
Egypt	..	3.0[a]	2.8	..	2.1[a]	2.6	..	0.9[a]	0.2	..	31.5[a]	8.4
Libyan Arab Jamahiriya	13.9	6.5	..	5.9	4.5	..	7.9	2.0	..	57.2	30.2	..
Morocco	4.1	4.4	..	2.6	2.4	..	1.5	2.0	..	37.3	44.6	..
Sudan	..	4.9	..	..	3.8	..	..	1.1	..	..	22.9	..
Tunisia	4.7	3.2	..	2.3	2.3	..	2.4	0.9	..	52.0	27.8	..
Southern Africa												
Botswana	15.7	9.6	14.0	3.6	4.5	5.1	12.2	5.1	8.9	77.4	53.3	63.7
South Africa	3.4	..	..	2.5	..	..	0.9	..	..	26.1	..	..
Western Africa												
Burkina Faso	..	..	9.4	..	..	4.0	..	..	5.4	..	..	57.4
Côte d'Ivoire	..	..	5.3	..	..	4.0	..	..	1.3	..	..	24.5
Ghana	4.7	3.3[a]	..	2.7	2.5[a]	..	1.9	0.8[a]	..	41.5	23.6[a]	..
Liberia	..	6.2	..	..	4.1	..	..	2.1	..	..	34.5	..
Mali	..	..	4.4	..	..	2.2	..	..	2.2	..	..	49.5
Senegal	..	..	3.6	..	..	2.7	..	..	1.0	..	..	26.6
Togo	5.8	..	..	3.5	..	..	2.4	..	..	40.7	..	..
Latin America												
Central America and the Caribbean												
Costa Rica	4.9	3.1	..	2.8	2.2	..	2.1	1.0	..	42.9	31.2	..
Cuba	2.5[a]	2.4	..	2.0[a]	1.0	..	0.5[a]	1.3	..	20.7[a]	56.0	..
Dominican Republic	5.8	5.3	..	3.0	2.9	..	2.8	2.4	..	47.8	44.9	..
El Salvador	3.7	..	2.9[a]	2.9	..	1.5[a]	0.8	..	1.4[a]	21.8	..	47.3[a]
Guatemala	3.0	..	..	1.8	..	..	1.1	..	..	37.6	..	..
Haiti	4.0[a]	1.5	..	1.9[a]	1.3	..	2.2[a]	0.2	..	53.6[a]	13.2	..
Honduras	5.0	..	4.9[a]	2.5	..	3.0[a]	2.5	..	1.9[a]	49.5	..	38.9[a]
Mexico	4.9	4.3	2.8	3.3	3.1	1.9	1.6	1.3	0.9	32.0	29.1	31.2
Nicaragua	4.5	..	..	2.5	..	..	1.9	..	..	43.2	..	..
Panama	4.5	2.9	3.2	2.7	2.0	2.3	1.8	0.9	1.0	40.5	31.0	29.6
Puerto Rico	4.2	3.0	1.6	1.5	1.7	1.0	2.7	1.4	0.6	63.6	44.9	38.1

TABLE IV.4 (*continued*)

	Annual intercensal growth rate of urban areas			Annual urban rate of natural increase			Annual rate of urban growth from internal migration/reclassification			Proportion of urban growth attributable to internal migration/reclassification (percentage)		
	1960s	*1970s*	*1980s*	*1960s*	*1970s*	*1980s*	*1960s*	*1970s*	*1980s*	*1960s*	*1970s*	*1980s*
South America												
Argentina	..	2.3[a]	1.9	..	1.6[a]	1.4	..	0.7[a]	0.5	..	30.1[a]	26.7
Bolivia	..	..	4.2[a]	..	..	2.2[a]	..	..	2.0[a]	..	..	47.3[a]
Brazil	5.1	4.3	2.9	2.6	2.3	1.8	2.5	2.1	1.1	48.3	47.2	37.5
Chile	3.0	2.8	1.8	2.0	2.0	1.7	1.0	0.7	0.1	34.3	26.6	6.6
Colombia	3.4	3.4	..	2.6	1.7	..	0.8	1.7	..	24.0	50.2	..
Ecuador	4.5	4.6	3.7	3.0	2.4	2.2	1.5	2.2	1.6	32.5	47.3	42.0
Guyana	8.8	..	..	2.5	..	..	6.3	..	..	71.6	..	..
Paraguay	3.1	3.8	4.7	2.1	2.0	2.8	1.1	1.8	1.9	33.8	47.3	41.2
Peru	4.9	3.5	2.8	2.9	2.4	2.0	2.1	1.1	0.8	41.8	32.2	29.3
Uruguay	0.7	1.0	..	0.6	0.6	..	0.1	0.4	..	8.8	40.8	..
Venezuela	4.1	3.9	3.0	3.2	3.0	2.4	0.9	1.0	0.6	21.1	24.5	20.1
Asia												
Eastern Asia												
China	..	..	4.6	..	..	1.3	..	..	3.3	..	..	71.9
Republic of Korea	6.2	5.0	4.1	2.5	2.2	1.9	3.8	2.8	2.3	60.3	56.3	55.0
South-eastern Asia												
Indonesia	3.6	5.2	5.2	2.5	2.6	2.2	1.1	2.6	3.1	31.5	50.6	58.8
Malaysia	..	4.9	..	..	2.2	..	..	2.7	..	..	54.8	..
Philippines	..	4.3	4.9	..	2.6	2.4	..	1.7	2.6	..	40.2	52.4
Thailand	..	5.2	2.9	..	2.2	1.6	..	3.0	1.3	..	57.8	44.5
Southern Asia												
Bangladesh	6.6	10.6	..	2.7	3.7	..	3.9	7.0	..	58.6	65.6	..
India	3.2	3.7	..	2.2	2.0	..	1.0	1.7	..	31.3	45.1	..
Iran (Islamic Rep. of)	..	4.8	5.3	..	2.7	3.8	..	2.1	1.6	..	43.2	29.6
Nepal	3.2	7.3	..	2.1	2.9	..	1.1	4.3	..	33.6	59.7	..
Pakistan	..	4.3	..	..	3.6	..	..	0.7	..	..	17.1	..
Sri Lanka	4.2	..	..	2.1	..	..	2.1	..	..	49.8	..	..
Western Asia												
Iraq	6.4	5.1	4.1	3.4	3.4	3.0	3.0	1.7	1.0	46.9	32.9	25.0
Israel	..	2.7	..	..	2.2	..	..	0.5	..	..	18.0	..
Syrian Arab Republic	4.9	4.0	..	3.3	3.2	..	1.5	0.8	..	31.1	20.9	..
Turkey	5.5	4.7	..	2.1	2.2	..	3.4	2.5	..	61.7	52.3	..

TABLE IV.4 (*continued*)

	Annual intercensal growth rate of urban areas			*Annual urban rate of natural increase*			*Annual rate of urban growth from internal migration/reclassification*			*Proportion of urban growth attributable to internal migration/reclassification (percentage)*		
	1960s	*1970s*	*1980s*	*1960s*	*1970s*	*1980s*	*1960s*	*1970s*	*1980s*	*1960s*	*1970s*	*1980s*
Minimum	0.7	1.0	1.6	0.6	0.6	1.0	0.1	0.2	0.1	8.8	13.2	6.6
Maximum	15.7	12.6	14.0	5.9	4.8	5.1	12.2	7.8	8.9	77.4	65.6	71.9
Number of countries	36	41	27	36	41	27	36	41	27	36	41	27
Mean	5.0	4.7	4.3	2.6	2.6	2.4	2.4	2.1	1.9	41.8	40.5	39.0
Median	4.5	4.3	4.1	2.5	2.4	2.2	1.9	1.7	1.4	41.1	43.2	38.9

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat.

[a]The two censuses were separated by considerably more than 10 years. The estimates presented refer to a 10-year period ending at the date of the second census. Because of the length of the original interval, the estimates obtained should be interpreted with caution.

Table IV.5 also presents regional estimates of rural out-migration rates. For the developing world as a whole, they rise from 0.61 per cent in the 1960s to 1.14 per cent in the 1980s if China is included and to 1.47 per cent if China is excluded. Different trends characterize the three major developing areas. In Africa, rural out-migration rates decline steadily from the 1960s to the 1980s, whereas in developing Asia they increase steadily (irrespective of whether China is included or not). In Latin America and the Caribbean, rural out-migration rates increase between the 1960s and the 1970s and then decline. Such trends are consistent with what is known about the economic situation of those major regions. In Africa, most economic indicators point to a deterioration of economic opportunities since the 1960s, and declining rural out-migration rates are consistent with such a scenario.[3] In Asia, the increasing rural out-migration rates are consistent with the rising economic dynamism in the region, although those rates have been very low and are still only moderate. In contrast, rural out-migration rates in Latin America and the Caribbean have been high and their fluctuation over time correlates well with the changing economic situation in the region.

TABLE IV.5. ESTIMATES OF THE COMPONENTS OF URBAN GROWTH AT THE REGIONAL LEVEL

	1960s	*1970s*	*1980s*	*1980s, excluding China*
Africa				
Urban population	18 135 000	38 831 000	32 858 000	
Rural population	31 277 000	89 368 000	58 461 000	
Urban natural increase	476 320	1 014 002	917 817	
Net number of rural-urban migrants	333 122	692 302	303 629	
Total net gain	809 443	1 706 304	1 221 447	
Proportion due to migration (percentage)	41.2	40.6	24.9	
Rate of natural increase of urban areas (percentage)	2.63	2.61	2.79	
Rural out-migration rate (percentage)	1.07	0.77	0.52	
Latin America				
Urban population	112 573 000	184 994 000	227 992 000	
Rural population	105 664 000	108 341 000	94 777 000	
Urban natural increase	3 036 246	4 223 178	4 223 886	
Net number of rural-urban migrants	2 032 718	2 871 882	2 161 934	
Total net gain	5 068 963	7 095 060	6 385 819	
Proportion due to migration (percentage)	40.1	40.5	33.9	
Rate of natural increase of urban areas (percentage)	2.70	2.28	1.85	
Rural out-migration rate (percentage)	1.92	2.65	2.28	
Asia				
Urban population	142 222 000	274 162 000	380 690 000	139 473 000
Rural population	612 806 000	873 718 000	1 067 651 000	238 694 000
Urban natural increase	3 285 794	6 552 978	6 518 400	3 433 705
Net number of rural-urban migrants	2 226 120	5 747 542	11 407 985	3 282 021
Total net gain	5 511 913	12 300 520	17 926 385	6 715 726
Proportion due to migration (percentage)	40.4	46.7	63.6	48.9
Rate of natural increase of urban areas (percentage)	2.31	2.39	1.71	2.46
Rural out-migration rate (percentage)	0.36	0.66	1.07	1.37
Developing world				
Urban population	272 930 000	497 987 000	641 540 000	400 323 000
Rural population	749 747 000	1 071 427 000	1 220 889 000	391 932 000
Urban natural increase	6 798 360	11 790 158	11 660 103	8 575 408
Net number of rural-urban migrants	4 591 960	9 311 726	13 873 548	5 747 584
Total net gain	11 390 319	21 101 884	25 533 651	14 322 992
Proportion due to migration (percentage)	40.3	44.1	54.3	40.1
Rate of natural increase of urban areas (percentage)	2.49	2.37	1.82	2.14
Rural out-migration rate (percentage)	0.61	0.87	1.14	1.47

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat.

Estimates of the proportion of urban growth attributable to net rural-urban migration and reclassification corroborate that, as concluded in an earlier study (United Nations, 1980), natural increase accounted for about 60 per cent of urban growth in the 1960s whereas rural-urban migration accounted for the other 40 per cent. During the 1970s there was a slight tendency for the contribution of rural-urban migration to increase (44 per cent), particularly because of its greater weight in Asia. But by the 1980s, when fertility had been reduced in many countries, net rural-urban migration accounted for 54 per cent of urban growth in developing countries, although its contribution varied by region, ranging from 25 per cent in Africa to 64 per cent in developing Asia (with China included). Without China, net rural-urban migration accounted for about 50 per cent of population growth in the urban areas of other Asian countries. That is still a high proportion compared to the 34 per cent accounted for by migration in Latin America. These findings suggest that, especially in regions characterized by economic stagnation, the role played by natural increase in explaining urban population growth has been strengthened.

3. *Population distribution in the more developed regions*

The urbanization trends experienced by developed countries until the 1950s suggested that the increasing concentration of the urban population in ever larger urban centres was a natural concomitant of the rising proportion of people living in urban areas. However, between 1965 and 1985, a tendency towards population deconcentration was noticed in a number of developed countries. Berry (1976) coined the term "counter-urbanization" to denote the process by which the larger metropolitan areas lost population, at least in relative terms, to smaller urban centres. Fielding (1982) provided a more rigorous definition of the term by suggesting that counter-urbanization arises when there is a negative correlation between the net migration rate of places across the settlement system and their respective population. The widespread shift towards counter-urbanization was first detected in the United States of America where, between the 1960s and 1970-1973, non-metropolitan areas passed from registering net migration losses of 300,000 persons annually to net gains of 400,000 annually (Beale, 1975). During the 1970s, the population in large metropolitan areas of the United States grew at half the rate of medium-sized and smaller metropolitan areas, with non-metropolitan areas outpacing the metropolitan aggregate (Frey, 1992). Other studies confirmed that similar developments were occurring in different developed countries, including Australia, Denmark, France, Germany, Italy, Japan, Norway and the United Kingdom, though the scale and timing of the phenomenon, and to some extent its nature, differed from country to country (Champion, 1989).

Despite the expectation that the shift away from population concentration in the larger metropolitan areas to that in medium-sized and small settlements would accelerate during the 1980s, recent evidence has failed to corroborate such a trend and suggests that the tendency towards population concentration in the larger urban places has returned. The most significant reversal seems to have taken place in the United States during the 1980s, though there is also evidence that the growth rates of Paris, London and other agglomerations have increased in recent years (Champion, 1994; United Nations, 1995).

Although the causes of both counter-urbanization and the return of population concentration in larger metropolitan areas remain largely to be elucidated, several suggestions have been advanced (Champion, 1994). The fertility declines registered during the 1960s, which tended to be more accentuated in metropolitan areas, contributed to reducing the growth of those areas with respect to that of other urban centres. In addition, the growing levels of international migration, particularly during the late 1980s, coupled with the tendency of international migrants to settle in metropolitan areas helped to accentuate the traditional form of population concentration. Yet, changes in internal migration remain the key element leading to counter-urbanization and its reversal. The underlying causes of those changes include the new spatial division of labour stemming from the changing structure of corporate organization that has made possible the relocation of manufacturing away from major industrial centres. The successful development of economic activity based in rural areas, particularly that associated with energy resource development, agriculture and forestry, was also a factor contributing to counter-urbanization during the 1970s, especially in the United States. Changing residential preferences associated with changes in the age structure of the population appear to have played a role as well. Lastly, government actions regarding infrastructure investment, including the expansion of transportation networks and the improvement of health and educational services in smaller communities; the support provided for agriculture, forestry and rural development in general; and the adoption of decentralization policies and "new town" development, all contributed to the fuelling of counter-urbanization. However, the economic downturn that affected much of the developed world during the late 1970s and early 1980s weakened the commitment of Governments to those policies, and their subsequent deregulation of various elements of economic activity and service provision is likely to have renewed the advantages associated with the concentration of business, and consequently of population, in large metropolitan areas.

B. Past trends and future prospects for urban, city and rural population growth

1. *Urban and rural population size and growth*

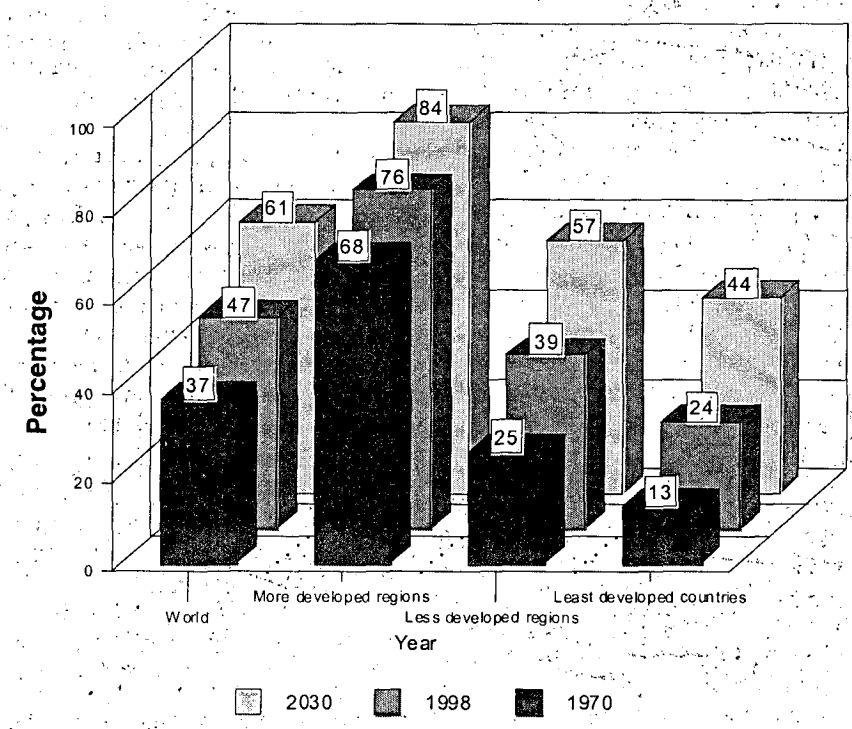
The driving forces for the increase in the level of urbanization in a country and the growth of large urban agglomerations or cities are socio-economic and political as well as demographic. The steady increase in the level of urbanization worldwide, for instance, reflects the fact that the world's economy has grown in magnitude since the 1950s. Information on the levels and trends of urban and rural growth allows policy makers to identify systematic patterns and hence contribute to a better understanding of the process of development. These data are also essential for policy makers in assisting them to anticipate problems that are inevitably associated with such major social transformations as urbanization and the growth of large urban agglomerations.

According to estimates prepared by the United Nations Population Division, 47 per cent of the world population lived in urban areas in mid-1998 (figure IV.1). The urban percentage is nearly identical for men and women. Urban populations are growing three times faster than their rural counterpart. As a result, half of the world population is expected to be urban by 2006. More than three fifths will be living in urban areas by 2030 (United Nations, 1998).

In 1998, nearly two of every five persons lived in cities in the less developed regions whereas about three of every four persons lived in cities in the more developed regions. This gap between the more developed regions and the less developed regions has narrowed since 1975. In 1975, 70 per cent of the population of the more developed regions was urban while only 27 per cent of the population in the less developed regions was living in cities (figure IV.1). The gap is expected to continue to narrow in the future, as rapid urbanization continues in the less developed regions. By 2030 it is projected that 57 per cent of the population in the less developed regions will be urban-dwellers, about two thirds of the level in the more developed regions (84 per cent).

In 1998, 68 per cent of the world's urban population lived in the less developed regions. By 2030, 80 per cent will (table IV.6). This changing distribution of the world's urban population between the less developed and the more developed regions reflects the different rates of total population growth between these regions as well as the different rates of urbanization. The urban growth rate of the world was 2.6 per cent annually during 1970-1990 and declined to 2.3 per cent per annum in 1995-2000. It is expected to decline further to reach 1.6 per cent per annum by 2025-2030. In the less developed regions the urban growth rate reached its peak at 3.8 per cent annually during the 1975 to 1985 period and has been declining since

Figure IV.1. Percentage of population residing in urban areas, 1970, 1998 and 2030



Source: World Urbanization Prospects: The 1996 Revision (United Nations publication, Sales No. E.98.XIII.6), special tabulations.

TABLE IV.6. DISTRIBUTION OF TOTAL, URBAN AND RURAL POPULATION OF THE WORLD BETWEEN MORE DEVELOPED AND LESS DEVELOPED REGIONS, 1970, 1998 AND 2030

(*Percentage*)

Region	Total population			Urban population			Rural population		
	1970	1998	2030	1970	1998	2030	1970	1998	2030
World	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less developed regions	72.8	80.1	85.5	50.2	67.6	80.2	86.1	90.9	93.9
More developed regions	27.2	19.9	14.5	49.8	32.4	19.8	13.9	9.1	6.1

Source: *World Urbanization Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.XIII.6), special tabulations.

1985. It is 3.2 per cent in 1995-2000 and is projected to decline to 1.9 per cent per annum between 2025 and 2030.

In spite of the declining rate of urban population growth, the average annual increment of the world's urban population is steadily becoming larger (table IV.7). While the annual increment during the period 1970-1998 was 50 million inhabitants, it is projected at 74 million between 1998 and 2030. Paralleling the shift of the world population from the more developed regions to the less developed regions, the latter are projected to account for an increasing share of the urban increment. Of the 50 million people added annually to the urban population during 1970-1998, 85 per cent is attributed to the less developed regions, and this share is further projected to reach 95 per cent between 1998 and 2030, meaning that almost all urban-dwellers being added to the world's population will be coming from developing countries.

In the more developed regions, between 1970 and 1998, 7.6 million inhabitants annually were added to the urban areas, and for the next 32 years, it is projected that the annual increment of urban population in the more developed regions will decrease to 3.8 million people each year.

The world rural population is still growing and is expected to continue to do so, but in smaller increments. Table IV.7 shows that the number of rural-dwellers in the world increased from 2.3 billion in 1970 to 3.2 billion in 1998 and is projected to reach 3.3 billion in 2030. The corresponding growth rate for 1970-1998 was 1.1 per cent per annum, and it is projected to be 0.08 per cent annually on average over the next 32 years.

Urban and rural growth in the less developed regions

By 1998, almost 40 per cent of the population of the less developed regions had become urban-dwellers. The urban population is growing at a rate of 3.2 per cent per annum between 1995 and 2000. Half of the population of the less developed regions will become urban-dwellers in 2016 and it is expected that 57 per cent, a total of 4.1 billion people, will reside in urban areas by 2030.

The least developed countries, within the less developed regions, are characterized by both a lower proportion of population residing in urban areas and faster urban growth. In 1970, 13 per cent of the population of those countries, a total of 39 million, resided in urban areas. By mid-1998, almost one in four persons (24 per cent) lived in urban areas, a total of 152 million people. This increase implies an annual growth rate of 4.9 per cent per annum during the past 28 years. It is expected that 44 per cent of the population of these countries (558 million) will be urban-dwellers by 2030, a level well below that of the less developed regions as a whole (57 per cent).

The less developed regions of Asia, i.e. excluding Japan, were home to 65 per cent of the urban-dwellers in the less developed regions in 1998. Asia is followed by Latin America and the Caribbean (20 per cent) and Africa (15 per cent). By 2030, it is expected that the share of Latin America and the Caribbean of the urban population will decrease to 15 per cent while that of Africa will increase to 21 per cent.

Africa exhibits the lowest levels of urbanization and the fastest urban growth in the world. In 1970, 23 per cent of Africans resided in urban areas. By mid-1998, 37 per cent of Africans were urban-dwellers and the 50 per cent mark is expected to be reached between 2020 and 2025. By 2030, 54 per cent of Africans will be urban-dwellers. Northern Africa and Southern Africa were the most urbanized, with around 50 per cent of their population living in urban areas in 1998. Western Africa and Middle Africa are in between with 39 and 34 per cent, respectively, and Eastern Africa has the lowest level (24 per cent). The urban growth rate is projected to remain the highest until 2030. The urban growth rate decreased slightly from 4.4 per cent in 1970-1975 to 4.2 per cent in 1995-2000. Projections show that the growth rate will decline gradually to 2.8 per cent by 2025-2030.

Africa is the only major area where the number of rural-dwellers is not expected to decrease within the next three decades, so that by the year 2030, 725 million people are expected to reside in rural areas. In 1998, 493 million Africans were rural-dwellers. This population is increasing at a rate of 1.7 per cent per annum between 1995 and 2000. Only after 2020 is the rural growth rate expected to decrease to less than 1 per cent per annum.

Latin America and the Caribbean is the most urbanized major area of the less developed regions. In 1970, 57 per cent of the population in Latin America and the Caribbean were urban; and at mid-1998, 75 per cent were urban-dwellers. Between 1998 and 2030, it is expected that 226

TABLE IV.7. AVERAGE ANNUAL POPULATION INCREMENT, 1970-1998 AND 1998-2030
(*Thousands*)

Region	Urban 1970-1998	Urban 1998-2030	Rural 1970-1998	Rural 1998-2030
World total	50 137	73 626	29 432	2 680
More developed regions	7 563	3 791	-1 354	-2 834
Less developed regions	42 574	69 835	30 785	5 514
Least developed countries	4 046	12 662	7 297	7 349
Africa	7 192	18 074	7 608	7 252
Eastern Africa	1,667	5 229	3 032	3 792
Middle Africa	747	2 516	1 051	1 198
Northern Africa	1 877	3 079	1 078	143
Southern Africa	487	989	415	178
Western Africa	2 414	6 261	2 032	1 941
Asia	28 723	44 662	22 772	-1 916
Asia excluding Japan	27 845	44 591	22 879	-1 617
Eastern Asia	11 672	13 795	5 224	-5 855
Eastern Asia excluding Japan	10 794	13 723	5 331	-5 557
China	9 491	13 055	5 667	-5 408
Japan	878	71	-107	-299
South-central Asia	9 600	19 875	13 839	3 804
South-eastern Asia	4 335	6 798	3 498	-24
Western Asia	3 117	4 194	212	160
Europe	4 240	925	-1 634	-2 154
Eastern Europe	2 357	192	-1 212	-1 127
Northern Europe	296	197	-72	-138
Southern Europe	752	242	-155	-552
Western Europe	836	294	-196	-337
Latin America and the Caribbean	7 498	7 067	217	-182
Caribbean	412	431	20	-13
Central America	1 826	2 006	433	134
South America	5 260	4 630	-236	-304
Northern America	2 236	2 566	354	-379
Oceania	248	331	114	58
Oceania, developing countries	40	103	81	61
Australia/New Zealand	208	228	33	-3
Melanesia	30	84	74	57
Micronesia	5	10	4	2
Polynesia	5	8	3	1

Source: *World Urbanization Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.XIII.6), special tabulations.

million people will be added to the urban population, thus bringing the urban percentage to 83 per cent.

This high level of urbanization in Latin America and the Caribbean as a whole hides some disparities at the regional level. Some of these disparities need to be singled out. For example, the Caribbean and Central America exhibited lower levels of urbanization (63 and 67 per cent, respectively, in 1998), while South America had the highest level of urbanization (79 per cent) within the major area.

Latin America and the Caribbean is the only major area whose urban growth rate has declined steadily since 1950. The urban population of Latin America and the Caribbean is growing at 2.1 per cent per annum during the period 1995-2000. The urban growth rate is projected to dip below 2 per cent after 2000 and to reach 1.1 per cent per annum by 2025-2030.

While the size of the rural population of Latin America and the Caribbean increased from 121 million in 1970 to 127 million in 1985, the rural growth rate declined from 0.54 per cent to 0.14 per cent per annum during this period. After a plateau between 1985 and 2005, the size of rural Latin America and the Caribbean is expected to decline after 2005, to 121 million in 2030. Meanwhile, the rural population is still expected to grow in some regions and countries. For example, the rural population is expected to increase in Belize, Guatemala, Haiti and Paraguay up to 2030.

The level of urbanization in the less developed regions of Asia is similar to that of Africa as a whole, with 36 per cent living in urban areas in 1998. However, the regions and countries in Asia exhibit more contrasting patterns. With more than two thirds (70 per cent) of its population living in urban areas, Western Asia was the most urbanized Asian region in 1998. It is followed by South-eastern Asia (36 per cent) and by Eastern Asia (excluding Japan) (35 per cent). South-central Asia is the least urbanized major area in Asia with only 30 per cent of its population living in cities. By 2030, it is expected that 54 per cent of the population of the less developed regions of Asia will be urban-dwellers, ranging from four of every five persons in Western Asia to less than half in South-central Asia.

The rural population of developing Asia increased from 1.6 billion in 1970 to 2.3 billion in 1998. It is expected to peak at 2.35 billion in 2010 before declining back to 2.2 billion by 2030. The growth rate of the rural population in the less developed regions of Asia was 0.7 per cent per annum between 1990 and 1995. It is expected to decline to 0.1 per cent in 2005-2010, after which it will turn negative and reach -0.5 per cent per annum by 2025-2030.

In 1998, 25 per cent of the less developed regions of Oceania (Melanesia, Micronesia and Polynesia) were urban-dwellers. In 1998, it is estimated that about one of every five Melanesians were urban-dwellers, as were 44 per cent of Micronesians and 43 per cent of Polynesians. The urban population is expected to continue to grow at a rate above 2 per cent per annum in Micronesia and Melanesia. In Polynesia, the urban growth rate is expected to decrease below 2 per cent only after 2025.

The rural population of the less developed regions of Oceania is expected to increase from 5.5 million in 1998 to 7.4 million in 2030. At the regional level, Polynesia and Micronesia are expected to experience a decline of their

rural population after 2025. Meanwhile, at the country level, the rural population will increase through 2030 in Micronesia, Papua New Guinea, Samoa, Solomon Islands and Vanuatu.

Urbanization in the more developed regions

The level of urbanization is high in the more developed regions of the world. Nevertheless, some differences are apparent among regions. Among the 38 countries in the more developed regions with a population of 2 million or more in 1998, 14 were more than three quarters urbanized and 21 were between 50 and 75 per cent urbanized. On the other hand, Bosnia had 42 per cent of its population living in urban areas and Albania and Portugal had less than 40 per cent. Three very small European countries (the Holy See, Gibraltar and Monaco) are essentially city-States and are 100 per cent urban, as is Bermuda in Northern America.

In 1950, slightly more than half the European population resided in urban areas (52 per cent); by 1970, this figure had increased to 68 per cent. At mid-1998, 76 per cent of the European population were urban-dwellers and, by 2030, it is expected that 84 per cent of Europeans will live in cities. Among the regions of Europe, large differences in the levels of urbanization are apparent. In 1970, 56 per cent of Eastern Europeans and 57 per cent of Southern Europeans resided in urban areas; however, 77 per cent of Western Europeans and 80 per cent of Northern Europeans lived in urban areas. By mid-1998, 71 per cent of the population in Eastern Europe and 65 per cent in Southern Europe lived in cities, whereas 84 and 82 per cent, respectively, of the population of Northern Europe and Western Europe are urban-dwellers. By 2030, the ranking in the level of urbanization in Europe is expected to stay the same, with Northern Europe exhibiting the highest proportion of population in urban areas (89 per cent), followed by Western Europe (88 per cent), Eastern Europe (81 per cent) and Southern Europe (75 per cent).

The urban population growth rates for the regions of Europe generally show a similar trend; all except Eastern Europe peaked during the period 1960-1965 and exhibited a declining trend thereafter. In fact, Western Europe and Eastern Europe are expected to experience a decline in urban population in 2025-2030. Rural population has been declining in Europe since 1950. The annual rate of decline had been -0.78 per cent per annum for the past 28 years and is projected at -1.4 per cent per annum for the next 32 years.

The level and pace of urbanization are different in Northern America, Japan and Australia/New Zealand. Overall, more than three out of every four persons in these regions resided in urban areas in 1998. It is expected that by 2030 over 80 per cent will live in urban areas.

The urban population in Japan is 99 million in 1998, having increased from 74 million in 1970. This number is expected to increase only slightly to 101 million by 2030. Japan's urban growth rate peaked at 3.4 per cent per annum between 1950 and 1955. It decreased to 2.6 per cent per annum in 1970-1975 and 0.4 per cent per annum in 1995-2000. It is expected to decrease further, become negative after 2015 and reach -0.2 per cent in 2025-2030. Japan's rate of rural population growth was already negative in 1950-1955 (-0.8 per cent per annum). It declined further to -2.1 per cent in 1970-1975 and is currently estimated at -0.6 per cent per annum in 1995-2000. Japan's rural population is projected to continue declining, and to be around 17 million in 2030.

Northern America had an urban population of 233 million in 1998. By 2030, it is projected that 316 million urban-dwellers will live in the region. After a peak of 2.7 per cent per annum in 1950-1955, the urban growth rate decreased to 1.1 per cent in 1970-1998 and is expected to decrease to 0.5 per cent in 2025-2030, with an average rate of 0.9 per cent per annum between 1998 and 2030. Northern America's rate of rural population change showed an oscillating trend. After experiencing negative growth between 1950 and 1970, the rural population grew by 0.9 per cent per annum between 1970 and 1980. Those years are known as the "counter-urbanization" period when the population of larger American cities moved to suburban or rural areas.

In Australia/New Zealand, 85 per cent of the population resided in urban areas in 1998. By 2030, 89 per cent of the population of Australia/New Zealand is expected to be urban. The urban population of this region grew at 1.3 per cent per annum between 1970 and 1998 and is expected to grow at a rate of 1.0 per cent between now and 2030. The rural population of Australia/New Zealand remained relatively constant at 2.6 million between 1950 and 1960, before declining to 2.4 million in 1970. The rural population began to grow again after 1970, reaching 3.3 million in 1998. It is projected to further increase until 2010.

Gender and urban/rural population distribution

In some regions of the world, the ratio of men to women is much higher in urban areas than in rural ones. This is the case in many of the less developed regions, particularly in Africa (table IV.8). All regions of Africa, except for Northern Africa, as well as Southern Asia and Western Asia, had, on average, much higher ratios of men to women in urban areas than in rural areas, reflecting the predominance of male migrants to cities. In Northern Africa, Eastern Asia and South-eastern Asia, the sex ratios were nearly the same in urban and rural areas, showing no gender difference in urbanization. In all the regions of Latin America and the Caribbean, as well as in all the more developed regions, the ratios of men to women are much higher in rural areas than in urban areas, showing the strength of female migration to urban areas.

2. *The 15 largest urban agglomerations*

The giant urban agglomerations, a recent phenomenon, are becoming both larger and more numerous, sheltering an increasing proportion of urban-dwellers. These giant urban agglomerations have special problems linked to their size, which place them apart from the other large, but smaller, cities.

TABLE IV.8. SEX RATIOS OF POPULATION IN URBAN AND RURAL AREAS, 1995
(Men per 100 women)

Major area or region	*Urban*	*Rural*
World total	101	102
More developed regions	94	98
Less developed regions	105	102
Africa	104	97
Eastern Africa	105	97
Middle Africa	105	94
Northern Africa	103	101
Southern Africa	102	95
Western Africa	104	95
Asia	107	103
Eastern Asia	105	104
South-eastern Asia	100	99
Southern Asia	113	104
Western Asia	110	97
Europe	94	100
Eastern Europe	94	98
Northern Europe	95	103
Southern Europe	94	100
Western Europe	94	101
Latin America	96	109
Caribbean	94	109
Central America	96	107
South America	96	110
Northern America	94	102
Oceania	100	106
Australia/New Zealand	98	112
USSR	90	92

Source: Urban and Rural Areas by Sex and Age: The 1992 Revision (United Nations, 1993), special tabulations.

Tokyo, with a population of 27.7 million in 1998 (table IV.9), continues to be in the front rank of the largest urban agglomerations in the world. It has been number one since 1970 and is projected to retain that rank during each quinquennial period until 2015. New York fell from first place in 1965 to second in 1970, a ranking it held until 1990. In 1998, New York was the fifth largest city (16.5 million), and it is expected to slip in the next 17 years, to ninth place (17.6 million) in 2015. The largest cities in the world in 1998 after Tokyo are Mexico City, São Paulo, Bombay, New York, Shanghai, Los Angeles, Calcutta, Buenos Aires, Lagos, Seoul, Beijing, Delhi, Karachi and Osaka. Their populations ranged from 10.6 million to 27.7 million.

The list of the 15 largest urban agglomerations is expected to change with respect to both composition and population size. By 2015, the list of the 15 largest urban agglomerations is expected to show Tokyo (28.9 million) and Bombay (26.2 million) as the largest, followed by Lagos (24.6 million).

3. *Distribution of cities and urban population by city-size class*

The urban structure of a country or region may be defined by examining the distribution of the urban population in different city-size classes as well as the importance of the primate city. The study of this urban hierarchy can reveal a great deal about the conditions and direction of its development, especially if the hierarchy is examined over time and in the context of the national level of urbanization.

Cities with 10 million or more inhabitants

Between 1970 and 1998, the number of cities with 10 million or more inhabitants grew from 3 to 18, accounting for 43.8 million and 243.9 million of the world urban population in 1950 and 1998, respectively. Of the 18 cities with 10 million or more inhabitants in 1998, two are in Africa (Lagos and Cairo), four in Latin America and the Caribbean, two in Northern America and 10 in Asia. It is projected that by 2015, 26 cities will have a population of 10 million or more (four in the more developed regions and 22 in the less developed regions). Africa will be home to two such cities, Asia will have 18 cities of this size, and four will be located in Latin America and the Caribbean. They will shelter 10.6 per cent of the world urban population in 2015. In 1998, 8.9 per cent of urban-dwellers lived in cities of that size.

Cities with from 5 million to 10 million inhabitants

The number of cities in the second size class, from 5 million to 10 million inhabitants, increased from 18 in 1970 to 23 in 1998, and it is expected to reach 38 in 2015. In 1970, eight of the 18 cities were in the more developed regions and 10 in the less developed regions. By 1998, only six of the 23 cities of this size were located in the more developed regions and 17 were in the less developed regions. At the world level, these cities comprised 6.2 per cent of the world urban population in 1970. In 1998, that share was 5.8 per cent and it will increase to 6.7 per cent in 2015.

TABLE IV.9. THE 15 LARGEST URBAN AGGLOMERATIONS RANKED BY POPULATION SIZE, 1970, 1998 AND 2015

Rank	Agglomeration and country	Population
	A. *1970*	
1	Tokyo, Japan	16.5
2	New York, United States of America	16.2
3	Shanghai, China	11.2
4	Osaka, Japan	9.4
5	Mexico City, Mexico	9.1
6	London, United Kingdom	8.6
7	Paris, France	8.5
8	Buenos Aires, Argentina	8.4
9	Los Angeles, United States of America	8.4
10	Beijing, China	8.1
11	São Paulo, Brazil	8.1
12	Moscow, Russian Federation	7.1
13	Rio de Janeiro, Brazil	7.0
14	Calcutta, India	6.9
15	Chicago, United States of America	6.7
	B. *1998*	
1	Tokyo, Japan	27.7
2	Mexico City, Mexico	17.6
3	São Paulo, Brazil	17.3
4	Bombay, India	16.9
5	New York, United States of America	16.5
6	Shanghai, China	13.9
7	Los Angeles, United States of America	12.9
8	Calcutta, India	12.5
9	Buenos Aires, Argentina	12.2
10	Lagos, Nigeria	12.1
11	Seoul, Republic of Korea	12.0
12	Beijing, China	11.7
13	Delhi, India	11.0
14	Karachi, Pakistan	10.9
15	Osaka, Japan	10.6
	C. *2015*	
1	Tokyo, Japan	28.9
2	Bombay, India	26.2
3	Lagos, Nigeria	24.6
4	São Paulo, Brazil	20.3
5	Dhaka, Bangladesh	19.5
6	Karachi, Pakistan	19.4
7	Mexico City, Mexico	19.2
8	Shanghai, China	18.0
9	New York, United States of America	17.6
10	Calcutta, India	17.3
11	Delhi, India	16.9
12	Beijing, China	15.6
13	Metro Manila, Philippines	14.7
14	Cairo, Egypt	14.4
15	Los Angeles, United States of America	14.2

Source: World Urbanization Prospects: The 1996 Revision (United Nations publication, Sales No. E.98.XIII.6), special tabulations.

Cities of 1 million to 5 million inhabitants

The number of these cities increased from 144 in 1970 to 312 in 1998. By 2015, 463 cities are expected to reach this size. At the regional level, in 1970, 73 such cities were in the more developed regions and 71 in the less developed regions. In 1998, two thirds of the cities of this size were located in the less developed regions. By 2015, three quarters of the cities with 1 million to 5 million inhabitants are expected to be located in the less developed regions. The average population size of these cities was 1.8 million in 1970, 2.0 million in 1998, and it is expected to remain the same in the future.

Cities of fewer than 1 million inhabitants

The cities of this size had 68 per cent of the world urban population in 1970. Their share decreased to 63 per cent in 1998. It is expected to decrease further to 59 per cent by 2015. In the less developed regions, 69 per cent of the urban population lived in such cities in 1970. By 1998, 63 per cent live in such cities. It is expected that their share will decrease to 58 per cent by 2015.

4. *Summary and implications*

Of the world population, 47 per cent lived in urban areas in 1998. Just after 2000, and for the first time in history, the number of urban-dwellers will outnumber the rural populations. The urban population is growing three times faster than its rural counterpart. By 2030, three of every five persons will be living in urban areas.

Asia is becoming home to more mega-cities each decade. Although this seems to be a new phenomenon for the twentieth century, evidence suggests that, in the previous centuries, Asia had a high concentration of the world's urban population and had the world's largest cities. The mega-cities in the less developed regions are growing faster than those in the more developed regions, and they are expected to continue to do so until 2015.

The phenomenon of deconcentration of population from some mega-cities into suburban areas or smaller cities known as counter-urbanization seems not to be restricted to cities in the more developed regions. Some mega-cities in the less developed regions have also experienced a slowdown in their population growth. The largest cities in the world seem to grow through a cycle of four phases: (*a*) urbanization, with the core of the city growing faster than the ring of the city; (*b*) suburbanization, with the ring of the city growing faster than the core of the city; (*c*) counter-urbanization, with declining growth in the core as well as in the ring of the city; and (*d*) reurbanization, with the core of the city growing faster than the ring of the city. European and Northern American cities have reached the third or the fourth phase of the "urban transition".

Some of the largest cities in Latin America and the Caribbean are experiencing a slowdown in their population growth, and a reduction of their share of the urban population of these countries. Many of these cities are also

TABLE IV.10. GOVERNMENTS' VIEWS ON SPATIAL DISTRIBUTION BY LEVEL OF DEVELOPMENT AND MAJOR AREA, 1998
(*Number of countries*)

	View			
	Satisfactory	*Minor change desired*	*Major change desired*	*Total*
A. *By level of development*				
World	49	52	78	179
More developed regions	21	14	9	44
Less developed regions	28	38	69	135
Of which least developed countries	6	12	29	47
B. *By major area*				
Africa	6	13	33	52
Asia	8	15	17	40
Europe	19	12	8	39
Latin America and the Caribbean	10	7	16	33
Northern America	2	0	0	2
Oceania	4	5	4	13

Source: Population Policy Data Bank maintained by the Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat; *National Population Policies* (United Nations, 1998).

characterized by a higher degree of primacy—an important share of the urban population in the country lives in a single city (Mexico City, 24.8 per cent; Buenos Aires, 38.5 per cent).

Although the share of the urban population in most mega-cities in the less developed regions is decreasing, it remains to be seen if the pattern of cyclic city growth will apply to the largest cities in the less developed regions of Asia and Africa.

It is conceivable that the factors which shape the development of cities over time, the "urban transition", are the same, but the processes involved vary in strength and impact between countries. The geographical position of the cities, the layout of the national territory and the recent pace of economic growth of the countries are factors which may contribute to increasing or reducing the influence of these factors.

Lastly, while half of the world urban population still lives in smaller cities with fewer than 500,000 inhabitants, the proportion of urban-dwellers living in the largest cities of 10 million or more increased from 3.2 to 7.1 per cent between 1970 and 1995, and it is expected to reach 10.6 per cent by 2015.

C. GOVERNMENT VIEWS AND POPULATION POLICIES

1. *Overview of population distribution policies*

In 1998, only 27 per cent of countries of the world considered their patterns of population distribution to be satisfactory (table IV.10). In contrast, 44 per cent of countries, 88 per cent of which are in the less developed regions, consider their patterns of population distribution to be a major concern. Patterns of population distribution are seen as a minor concern by 29 per cent of countries, 73 per cent of which are in the less developed regions.

In many developing countries, population distribution policies are largely synonymous with measures to reduce, or even to attempt to reverse, rural-urban migration, with the aim of controlling the growth of the primate city or other large metropolitan areas. Evidence indicates that these policies have not always been effective. Partially in response, many countries have adopted strong rural-oriented spatial policies.

In addition to slowing the growth of large metropolitan areas, many Governments throughout the developing world have strongly endorsed the concept of promoting small and medium-sized cities. However, whereas there is a broad consensus on the desirability of promoting small and medium-sized cities, it is far from clear how that should be done. A number of developing countries—e.g., Kazahkstan, Malaysia, Nigeria—have attempted to build new capitals in recent years. Regional development policies for lagging regions, border-region strategies and land colonization schemes also have been employed in a number of developing countries. In recent years, many countries have sought to promote balanced urban growth by means of indirect policy measures. Many Governments have adopted policies that seek to work alongside market forces—by channelling private investment to designated areas, providing infrastructure in under-served areas, or removing subsidies that previously favoured the residents of certain locations such as the national capital. The idea behind this approach is to create a "level playing field" whereby a number of areas of a country may be equally attractive to potential migrants.

Africa has consistently been the region where Governments express the most concern with their patterns of population distribution. In 1998, 63 per cent of the Governments in Africa considered that their patterns of population distribution required major change. This is nearly unchanged from 1992, when two thirds (67 per cent) desired major change. Only 12 per cent of African countries currently consider their patterns of population distribution to be satisfactory; another 25 per cent view it as a minor concern.

Most African countries continue to be greatly concerned with reducing out-migration from rural areas. Botswana reported in the Eighth United Nations Inquiry on Population and Development that it had developed policies and programmes for expanding and improving socio-economic infrastructure in rural areas, for creating

rural employment, and for improving education, health and social services in remote rural areas. In an effort to avoid the depopulation of certain regions of the country, the Central African Republic has adopted a number of measures, including provision of infrastructure (e.g., electrification, water supply) in the interior; establishment of an agricultural credit fund; development of rural commercial networks; improvement of security of goods and persons in rural areas; reforestation of rural slopes; and adoption of a system of regional planning suited to the reality of the country.

Djibouti reports that it seeks to reduce the continuing exodus from interior regions to the capital. Towards this end, the Government has multiplied development projects in small towns in the interior and established schools, water-supply projects, and agricultural schemes in rural areas. Ghana also seeks to reduce out-migration from rural areas—by improving the rural economy through such means as promoting cottage industries (e.g., handicrafts), small-scale enterprises and agro-based industries and expanding rural electrification and potable water-supply projects. Morocco is currently emphasizing the development of provincial headquarters; decentralization of decision-making to urban and rural communities; development of an investment code favouring urban centres outside the Casablanca-Rabat axis; and promotion of basic infrastructure (e.g., sanitation, electrification and irrigation) in rural areas.

Namibia reports that, in recognition of the fact that significant numbers of residents have migrated from rural areas to districts which offer better employment prospects, the Government has developed a Regional Planning and Development Policy to provide guiding mechanisms for decentralization and local participation. In South Africa, the Government is currently developing the so-called Maputo Development Corridor, which joins the industrial hub of South Africa, centred around Johannesburg, with the natural harbour of Maputo, Mozambique. Improvement of rail and road connections is expected to serve not only as a more cost-effective link with foreign markets but also as a feeder line for increased tourism, outside investment and employment growth (Southern African Analysis & Advice, 1997).

Since the early 1960s, Asian countries have also expressed concern about patterns of population distribution. As of 1998, only 20 per cent of Asian countries consider their patterns of population distribution to be satisfactory; 43 per cent of Asian countries expressed a major concern and another 37 per cent saw it as a minor concern. In South-eastern Asia, Indonesia has implemented various micro-financing schemes in rural areas as well as initiating a special programme for income generation in poor rural areas. Malaysia reports that is has adopted a number of policies and strategies that have influenced population movements, such as decentralization of industrial areas, the opening up of new development corridors and growth areas, and land development schemes. The Government of Malaysia has scaled back plans, however, for a new capital, Putrajaya, including the construction of a 270-square-kilometre "multimedia super corridor" (*Economist*, 20 December 1997). The Philippines seeks to influence the factors that indirectly influence the movement of people from Metro Manila to peripheral areas, such as encouraging schools and industries to locate at least 50 kilometres away from Metro Manila. In Western Asia, Israel reports that its policy is to encourage growth in cities with over 70,000 inhabitants in order to preserve open spaces between urban centres.

The countries of Latin America and the Caribbean continue to consider their patterns of population distribution to be a major concern. In 1998, just under half of countries in the region expressed a major concern about their patterns of population distribution; 21 per cent saw it as a minor concern and 30 per cent considered their patterns of population distribution to be satisfactory. Despite intense efforts over several decades to eliminate economic and social disparities between regions and to promote balanced urban growth, the Government of Cuba reports that there has been continuing migration towards the capital city of Havana; to address this movement, the Government adopted a "Decree for the Regulation of Migration Movement Towards Havana" in 1997. As a means of retaining people in their areas of origin, Costa Rica is emphasizing the development of export zones in less developed regions and the strengthening of basic services and economic activities such as tourism in rural areas. In recent years, Brazil has undertaken programmes to support local development in small urban centres and has provided incentives and credit to support rural development.

Although Chile reports that it has not adopted explicit population distribution policies, the Government reports that such measures as support to colonization zones and programmes to equip isolated areas have had discernible impacts on patterns of population distribution. To reduce pricing distortions, the Government reports that it intends to charge market prices for urban services for those who can afford it, thereby eliminating subsidies that serve as an indirect incentive to migration. Salary differentials for public officials by area of residence and the targeted use of housing investments, tax rebates, subsidies, technical assistance and so forth are also seen as having significant potential spatial impacts.

Europe has the highest proportion of Governments that consider their patterns of population distribution to be satisfactory, 49 per cent in 1998. Another 31 per cent of Governments report that they see the patterns as a minor concern and 20 per cent as a major concern. Patterns of urbanization in the European countries have been fairly diverse in recent years. Finland, Ireland and Norway have shown a return to strong urbanization; in addition, Austria, Iceland and the Netherlands have shown a return to urbanization from an earlier counter-urbanization tendency. Denmark, France, Greece, Italy and the United Kingdom show continued counter-urbanization tendencies, whereas post-1985 trends in Belgium, Germany, the Netherlands, Spain, Sweden and Switzerland are still un-

clear (Kontuly, 1997). Norway reports that the primary goal of its regional policies is to provide similar living conditions in all parts of the country. The aims of these policies are to stimulate settlement in rural areas and to stem the migration from the periphery to the central districts, in particular from northern to southern Norway. Finland reports that the aim of regional development is to improve the employment situation throughout the country, as well as to develop small and medium-sized regional centres, as a result of which migration from sparsely populated areas to regional centres will increase. With a view to promoting more sustainable patterns of urban development, the United Kingdom has developed a policy for locating a high proportion of new development within existing urban areas—through such strategies as reusing previously developed sites (so-called "land recycling") and linking the density of development to access by public transport (United Kingdom, 1997).

In Oceania, Fiji has the longest history of urbanization in Melanesia. In recent years, Fiji has adopted a policy for the decentralization of social services from the major urban centres. Fiji reports that government efforts to raise the standard of living in rural areas and to promote rural employment opportunities currently absorb some 60 per cent of total government expenditure.

2. *Population growth and policies in mega-cities*

There is a great diversity of experience among the world's mega-cities. In recent years, there has been a dramatic and unanticipated slowdown in the growth of mega-cities in the Latin American region, with the results of the 1990 census round surprising even local observers. Whereas a process of intra-metropolitan employment dispersal has been taking place for a number of years in such cities as Buenos Aires, São Paulo and Mexico City, the scale has increased greatly in recent years and manufacturing plants have been moving much greater distances and often beyond metropolitan boundaries—in the case of São Paulo, for example, within a 200-kilometre radius from the central core (Gilbert, 1993).

Many mega-cities in Asia experienced dramatic economic growth until the recent economic crisis. In South-eastern Asian countries as a whole, urbanization has been penetrating into the countryside: extended and dispersed mega-urban regions have evolved, encompassing hinterlands as far as 100 kilometres distant from the central core (McGee, 1995). In recent years, China's mega-cities have been growing at very rapid rates, although partly due to reclassification. The mega-cities of the Indian subcontinent (e.g., Bangalore, Bombay, Calcutta, Delhi, Hyderabad and Madras in India; Karachi and Lahore in Pakistan; and Dhaka, Bangladesh) have followed a somewhat different pattern, more similar to that of Africa, with urban growth being caused less by economic dynamism than by rural poverty and continuing high fertility.

Fuelled by continuing out-migration from impoverished rural areas and by high natural increase, and despite years of sustained recession, cities in Africa are growing very rapidly, at nearly twice the world average, putting incredible pressure on already strained economies. Whereas much of the academic literature stresses the strong link between economic development and urbanization, the relationship between the two is much weaker in Africa than elsewhere in the developing world. Many countries in the region experienced slow or negative rates of economic growth in recent decades, yet almost all countries in the region exhibited high urban growth rates.

A number of developing countries have devoted considerable efforts to devising strategies to reduce metropolitan growth, primarily by fostering the growth of secondary cities and promoting regional development. Mexico is an example. Since the early 1970s, Mexico has had a sequence of development plans (e.g., the National Urban Development Plan (1978); the National Plan of Industrial Development; the National Urban Development and Housing Programme (1983-1988); the Development Programme of the Metropolitan Area of Mexico City and the Central Region (1983-1988); the Strategic Project of Intermediate Cities; and the 100 Cities Programme (1989-1994)). These policies and programmes had minimal impact on influencing Mexico's patterns of population distribution (Brambila Paz, 1996). The paradox is that profound changes have occurred in patterns of population distribution in Mexico and other developing countries, yet regional policy is considered to have contributed very little to it. Indeed, deconcentration has occurred in practice when regional planning has been at its weakest, with few Governments in heavily indebted developing countries having any funds to invest in infrastructure in the poorer regions, or to offer incentives to industrialists to locate in the periphery (Gilbert, 1993).

Mega-city size on its own may not always be a critical policy variable. The size of a mega-city or mega-urban region is not always closely correlated with the severity of its negative externalities. The key challenge is to manage mega-city growth efficiently. Management of urban growth becomes more important as the integration of the world economy and the expansion of international trade and investment changes the bases of urban economic growth in the twenty-first century.

NOTES

[1]For more information on the methodology used, see United Nations (1980).

[2]From now on, explicit mention of reclassification as part of the estimates obtained will not be made. Consequently, it should be understood that the estimated contribution attributed to net rural-urban migration includes also the effects of reclassification of areas from rural to urban.

[3]It must be noted, however, that because the rural population of Africa has been growing substantially, lower rates of rural out-migration need not mean lower numbers of net rural-urban migrants. Furthermore, the few African countries for which data are available are not necessarily

representative of the continent as a whole. In fact, countries with very high rates of urban growth are under-represented in the data used.

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V. POPULATION GROWTH, ECONOMIC GROWTH, POVERTY, FOOD PROVISION AND THE ENVIRONMENT

Discussions of the effects of population factors on development and the environment have been featured periodically in United Nations meetings and reports, including expert group meetings that were convened before each of the three United Nations intergovernmental conferences focusing on population and development concerns—the World Population Conference in 1974, the International Population Conference in 1984 and the International Conference on Population and Development in 1994 (see United Nations, 1973, 1975, 1991, 1994, 1994a). There are many paths through which population factors could have either positive or negative effects on development. Empirically, it has been difficult to separate out the potentially offsetting effects of, for example, changes in birth rates and death rates, and implications of changing age structures, and it has also been difficult to isolate the effects of demographic factors from the many other contributors to economic and environmental change.

A. IMPACT OF POPULATION GROWTH ON ECONOMIC GROWTH

Debates surrounding the consequences of population growth on the pace of economic development have been both vigorous and contentious. Recent decades have witnessed major swings in thinking about population matters. Especially in the West, the 1960s and 1970s were dominated by "Malthusian traditionalist", pessimistic, and sometimes alarmist, accounts that associated rapid population growth with resource exhaustion, deficiencies of saving, crowding out of productive investments, famines, irreversible environmental damage, and ecological collapse.[1] However, the 1980s witnessed a reassessment: alarmism was replaced by moderated concern. The net negative impacts of rapid population growth were judged to vary considerably by country and over time, and population impacts were considered to be relatively small by comparison with other determinants of economic prosperity.

Illustrating this interpretation, an influential study by the National Research Council (1986) reached the "qualitative conclusion that slower population growth would be beneficial to the economic development of most developing countries" (p. 90). It was non-alarmist in tone; it avoided any "quantitative" judgements about the size of population impacts; it considered population to exert both positive and negative impacts; it found the negative population impacts to be relatively stronger in developing countries; and, most important, it highlighted the need to account for *feedbacks* and, in particular, "the mediating role that human behaviour and human institutions play in the relation between population growth and economic processes" (p. 4).

Examples of mediating impacts are numerous. One example is that of natural resources. While an increase in the pace of population growth certainly causes natural resources to be used at a more rapid rate, increased use will initially exert upward pressures on resource prices. Responses to such pressures will in turn "mediate" and dampen the pace at which resources are used. This is because rising resource prices will stimulate exploration and resource expansion, cause households and businesses to conserve on resources, and result in substituting more abundant for scarce resources. In the longer run, upward price pressures are attenuated and could even be reversed. The net impact of rapid population growth on resource use will therefore be dampened due to responses to price changes and market forces. Such feedbacks take some time to be fully revealed but are critical to assessing the full impacts of population growth.

The major causes of the shift in thinking about population matters are twofold. First, an accumulating empirical literature discounted the strength of several of the posited adverse effects of population growth. This was particularly true with respect to concerns about natural resource exhaustion (Simon, 1981), saving constraints and crowding out of investment (Hammer, 1985; Kelley, 1988), and the capacity of Governments to provide population-sensitive public services (Schultz, 1987). Secondly, and most important, the methodology used to evaluate the consequences of population growth was changed (*a*) to consider the impacts over a longer period of time and (*b*) to take into account indirect feedbacks within economic, social and political systems. This revised perspective resulted in reducing the assessed size of the impacts of population growth since the (often negative) short-run direct impacts were offset by the (often positive) longer-run and indirect impacts.[2]

A good example of going beyond initial short-run "direct" impacts of demographic change relates to assessing the "indirect" impacts of increased fertility on saving. While adding a child to a household will in the short run exert direct pressures on household saving to meet increased consumption needs, over the longer run there will be indirect impacts that need to be taken into account. In response to pressures caused by additional children,

parents may well work harder or longer; and eventually children may contribute to household and market work and income. The "net" impact of larger families on saving in the longer run, when these feedbacks or responses are fully accounted for, is unclear.

Population debates are now less contentious because the magnitude of the impacts is considered to be smaller and, because most participants in the debates now recognize that effects of population change vary between places and over time, claims are more qualified and guarded. Studies increasingly focus on areas where feedbacks, and especially Government policies, are important. Examples include evaluations of population linkages with (*a*) poverty, where the distribution of public entitlements can be decisive; (*b*) food production, where Government interventions have been critical; and (*c*) the environment, where market failure is prevalent.

The following sections will review research that has emerged over the past decade on the relationships between demographic change and the specific themes of poverty, food and the environment. The assessment of these themes will embrace four overarching perspectives. First, both the short- and the long-run impacts of demographic change will be considered in an attempt to effect a balanced and complete account. Second, the two-way relationships between population and political change will be explored since the size and nature of population impacts are critically related to public policy in several areas. Third, the institutional settings (e.g., the efficiency of markets, the ownership patterns of natural resources, the relative priorities accorded urban versus rural activity) that have a notable impact on the size of population impacts will be discussed. And finally, the pervasive and important interrelatedness between areas of population impacts—in this case between poverty, food provision and the environment—will be addressed. Understanding these synergies is critical to formulating and appraising the likely success of policy interventions.

1. *Recent findings*

Recent statistical findings on the impacts of rapid population growth on economic growth have changed, and this remains an area of ongoing research and continued debate.

More than a dozen studies using cross-country data for the 1960s and 1970s failed to unearth a statistically significant association between the growth rates of population and of per capita output (Kelley and Schmidt, 1994). As one analyst summarized: "[T]hese cross-national studies have not provided what we might hope for: a rough and stylized depiction of the consequences of rapid population growth, unless, indeed, the absence of significant results is itself the result" (Lee, 1983, p. 54). These results have had an important impact on population debates and have moderated evaluations of population impacts. Yet such simple correlations of such a complex process are difficult to interpret; indeed, in this case they are often misinterpreted. Still, the lack of any correlation was a notable empirical finding. It is important to note, however, that the lack of an empirical association of population and economic growth does not imply that demography is unimportant. It could (and likely does in this case) mean that important (negative and positive) population impacts on the economy exist, but that they are largely offsetting.

In contrast to studies using data for the 1960s and 1970s, recent assessments have unearthed fairly large negative correlations between population and per capita output growth based on data for the 1980s and early 1990s, as well as for the entire period from the 1960s to the mid-1990s.[3] This raises several questions. Has the impact of population growth changed? Could it be that the negative consequences of rapid population growth associated with diminishing returns to capital and the environment are emerging as relatively more important than, say, the positive impacts of scale, induced innovation/technical change and/or attenuating feedbacks? Are there unique features associated with economic conditions in the 1980s—a period encompassing significant structural adjustments, world recession wars and droughts—as well as the early 1990s—generally a period of stronger economic growth—that could account for the changed findings? Is it that, until recently, few countries had progressed far enough through the fertility transition for the age-structural effects to become economically important? More generally, is it possible that the net impacts of population growth vary systematically with the overall pace of economic growth?

Definitive answers to these questions are not yet forthcoming. However, recent inquires into the "new" correlations have extended both the results and the interpretation of the literature. First, the new cross-country results show that the impact of population is not only in terms of its rate of change, but possibly also its size and density. Each of the latter two factors reveals a statistically positive impact on economic growth in the 1980s, although those effects are not large enough to offset the negative growth-rate effect. Such a finding, while still preliminary, illustrates the need to examine separately (decompose) the various offsetting impacts of demographic change.

Decomposition is also fruitful in at least two other directions: (*a*) age-distributional changes as emphasized in life-cycle modelling by economists and (*b*) demographic components modelling (births, deaths, migrants) as emphasized by demographers and policy analysts (Coale and Hoover, 1958; Kelley and Schmidt, 1995 and 1998; Bloom and Williamson, 1998). Recent studies of these decompositions reveal reasonably strong impacts of specific aspects of demographic change, even in cases where the overall effect of population growth appears negligible. Such results show how a near-zero correlation between population and economic growth rates can conceal, during an historical period, important offsetting effects of the components of population change. Notably, recent studies have found that there are important macroeconomic benefits to mortality decline. They have also reawakened inter-

est in Coale and Hoover's (1958) argument that changes in the age structure due to fertility decline are favourable for economic growth during the demographic transition.

Finally, there are recent preliminary results that suggest the impact of population factors can vary by the level of economic development.[4] If true, such findings could be central to the perspectives governing all population assessments. First, there are likely to be systematic factors such as the level of per capita income (or correlates thereof) that condition the impacts of population growth on the economy. Second, the lack of correlation between population and economic growth rates in the earlier decades may simply reveal that population impact varies by country and setting, and over time: the positive and negative impacts largely cancelled in the earlier period. Finally, there is a priority need to identify and account for factors conditioning population impacts on the economy. Government policies represent a likely candidate and are emphasized in the present review.

2. *The political economy of economic and demographic change*

Government policies condition the form and the size of population impacts on the economy, and these policies likely respond, in turn, to demographic change. Government policies can be incompatible with promotion of economic growth in a situation of rapid population change. Farm policies are illustrative. Farmers have frequently faced constraints in the form of overvalued exchange rates that disadvantage their products in export markets, marketing boards that suppress farm prices and reduce the incentive to produce, taxes on farm inputs (e.g., fertilizers and pesticides) that raise the costs of innovation, and urban bias in the provision of social services (e.g., education) that encourage rural to urban migration.[5] Altering any one of these policies can significantly modify the impact of demographic change on food provision.

The Programme of Action of the International Conference on Population and Development reflected an intergovernmental consensus that "slower population growth has in many countries bought more time to adjust to further population increases" and that "even the difference of a single decade in the transition to stabilization levels of fertility can have a considerable positive impact on quality of life" (para. 3.14). Indeed, a majority of Governments in the less developed regions view their rates of population growth as being too high and report adopting measures intended to lower the rate of growth (see chap. II).

On the other hand, the time "bought" by slower population growth can be squandered if needed policy changes are not made. Indeed, procrastination can even heighten problems in the future. Given this perspective, it is important also to consider whether, and how, rapid population growth may affect a broad range of policies and institutions in ways that might either foster or hinder economic growth. The issue is an empirical one, although not one readily resolved based on information currently available.

B. Poverty

Poverty is identified primarily as the inability to meet minimum needs of consumption, most notably of food, housing, medical care and education. Poverty is frequently measured in absolute terms as the amount of income required to purchase a subsistence bundle of necessities. For making international comparisons most observers utilize the World Bank's absolute poverty line of US$ 1 per day in 1985 dollars.[6] This permits the calculation of a "headcount" as the numbers falling below the poverty line, and a headcount index as the percentage of the population in poverty. Measures of intensity include the "poverty gap", the percentage deviation of the average income of those in poverty from the poverty line. While poverty can be viewed in other ways (e.g., the extent or degree of the individual's absolute or relative deprivation, measured either in terms of income/consumption or by attributes such as life expectancy or education), attention here will be on the World Bank measure.[7]

Qualifications to the various measures of poverty as indicators of "welfare" are numerous, and several conceptual and measurement problems are directly relevant to assessment of the relationship between poverty and demographic factors: (*a*) none of the measures considers the satisfaction derived from children, or the misery from child deaths; (*b*) the differential age-specific needs of children, workers and the elderly are seldom reckoned; (*c*) "home production" facilitated by children, as well as scale economies in production and consumption, both correlated with household size, are also unreckoned. Failure to adjust for these dimensions overstates the negative impact of large families on welfare and the incidence and severity of poverty.

1. *Linkages of demography and poverty*

Standard economic theory most relevant to accounting for the incidence of poverty focuses on the individual's ownership of, or claim on, income-earning physical assets (e.g., land, capital, water), human capital assets (e.g., education and health), and entitlements to public services that enhance income and consumption. Simply stated, individuals with modest physical assets, poor health and/or limited education, and weak claims on public goods are most likely to be poor. It is not surprising that poverty is disproportionately located in rural areas, although women and children, and the weak and disabled, are also disproportionately poor.[8]

With these dimensions of poverty in mind, what are the predicted impacts of population growth at the aggregate level, and of large families at the household level, on poverty?

The aggregate level. An expansion of population growth will (usually with a lag) increase the labour force.

On the one hand, this will reduce the *relative* return to labour (wages) and increase the *relative* return to the owners of capital, land and natural resources. The short-run impact is adverse to the poor since they derive most of their income from wages. On the other hand, these negative impacts will be moderated in time by increased investments (caused by population growth) in capital and land given their now higher rates of return. Under plausible assumptions, such population-induced investments will expand employment and be skewed towards using low-cost labour, both outcomes (especially employment) that are favourable to the poor. As a result, standard macroeconomic theory is not sufficient to predict whether an increase in population growth will increase or decrease the incidence of poverty.

The household level. The impact of population growth on poverty at the household level is complex and not well understood. At the simplest level, the birth of a child will increase the likelihood of household impoverishment since limited resources must be distributed among more household members. However, as discussed above, such an outcome will plausibly induce additional work by other household members and, over time, the now older child will likely contribute to the household's economic activity. Even later, the child in adulthood may contribute to the support of parents in old age. This scenario emphasizes the importance of assessing the impact of large families over the complete life cycle. Thus, determining the impact of family size on poverty is largely an empirical issue (Panayotou, 1994, pp. 261 and 262), but again, one that is difficult to resolve with available data, which usually give a snapshot of conditions at one time rather than a series of views over the life cycle.

2. *Poverty incidence and trends*

Table V.1 provides estimates of the numbers classified as poor by region in developing and transition countries, a headcount index, and a measure of the "poverty gap" (United Nations, 1997, p. 69).

In 1993 around 1.3 billion people, or one quarter of the developing world, were classified as poor. Poverty is greatest in South Asia and sub-Saharan Africa where headcount rates are around 40 per cent; the severity of poverty is relatively high there as well. Headcount rates are considerably lower in East Asia and in Latin America and the Caribbean (averaging around 25 per cent), and especially low (4 per cent) in the Middle East and North Africa.

While recent trends over the six-year period from 1987 to 1993 may not be a reliable guide, the headcount index declined from 33.3 to 31.8. This improvement was not shared by all regions: headcount rates rose in Latin America and the Caribbean and sub-Saharan Africa and declined in South and East Asia and the Middle East.

Trends over a longer period (see table V.2) are available for 11 countries for which there were poverty surveys over a period of at least 10 years at the time of the World Bank assessment (World Bank, 1990, p. 41). The sample represents 50 per cent of the world's poor. The general picture is one of impressive reductions in poverty between 1960 and the mid-1980s. For example, the headcount index declined in Indonesia from 58 to 17 over 17 years; in Pakistan from 54 to 23 over 22 years; and in Thailand from 59 to 26 over 24 years. Sub-Saharan Africa did not share in these trends; poverty there was high and persistent. Furthermore, the financial crisis that began in East and South-eastern Asia during 1997 has erased some of the gains. Speaking in October 1998, James Wolfensohn, President of the World Bank, cited estimates that 20 million people fell back into poverty in those regions during the preceding year (*New York Times*, 1998).

3. *Demography and the determinants of poverty*

Macroeconomic interactions

At the macroeconomic level, the most important single determinant of poverty is the pace of overall economic activity (United Nations, 1997, p. 63), and especially employment. Since the poor are disproportionately represented in the ranks of the under- and unemployed, economic expansions that give rise to robust labour market demand typically reduce the incidence of poverty;[9] and conversely, notable contractions in overall economic activity, like that recently experienced in Asia, can have profound impacts on the numbers in poverty.

This connection between poverty and the pace of economic expansion can give rise to an indirect link between the rate of population growth and poverty. If high rates of population growth adversely affect the pace of economic growth and employment, then the incidence of poverty can be associated with the pace of population growth as well. This is a qualified "if" since convincing evidence of a reasonably strong and consistent negative population and economic growth relationship across a wide range of settings and over time is far from established. Nonetheless, most analysts would agree on the circumstances when such a relationship is most likely to occur and be negative: where land and natural resources are relatively scarce, where markets and governmental institutions are weak and unresponsive, and where education and health resources are lacking. These are the very circumstances that are commonly associated with poverty, so a link between poverty incidence and population growth for a subset of exceptionally poor countries represents a defensible hypothesis.

A negative statistical relationship between population and per capita output growth was found in the 1980s in cross-country data for a large number of developing economies, although this relationship was largely absent in the 1960s and 1970s (Kelley and Schmidt, 1994). It was also found that the size of the negative impact of population growth, especially in the 1980s, was greatest at low income levels. The 1980s was a period of stalled poverty reduction in many areas, especially in those with languishing

TABLE V.1. RECENT POVERTY TRENDS

Region	Number of poor (millions)		Headcount index (percentage of population below poverty level)		Poverty gap (percentage)	
	1987	1993	1987	1993	1987	1993
Developing and transition countries	1 227	1 314	30.1	29.4	9.5	9.2
Eastern Europe and Central Asia	2	15	0.6	3.5	0.2	1.1
Developing countries	1 225	1 299	33.3	31.8	10.8	10.5
Latin America and the Caribbean	91	110	22.0	23.5	8.2	9.1
Middle East and North Africa	10	11	4.7	4.1	0.9	0.6
Sub-Saharan Africa	180	219	38.5	39.1	14.4	15.3
South Asia	480	515	45.4	43.1	14.1	12.6
China, East Asia and the Pacific	464	446	28.2	26.0	8.3	7.8

Source: *Report on the World Social Situation, 1997* (United Nations publication, Sales No. E.97.IV.1), p. 69.
NOTE: Poverty line = $1 per day in 1986 purchasing power parity prices.

economic growth. Adverse impacts of population growth on aggregate economic performance may have played a part, although the quantitative importance of such a role is uncertain.[10]

A review of the empirical literature reveals that there is little direct evidence based on economy-wide data that population growth or high fertility exert a statistically identifiable net impact on the incidence of poverty.[11] However, such a finding is not surprising since the effects of demography are pervasive, triggering both positive and negative impacts on the underlying determinants of poverty. Thus, influences of demography, which individually may be quantitatively important, can also be offsetting (McNicoll, 1997).[12] Furthermore, data on poverty levels are too sparse to study this issue over time in most countries. However, one recent cross-national study, drawing upon better quality, more internationally comparable and more extensive poverty data for the 1980s, indicates that lower fertility may have contributed to reducing poverty rates in developing countries (Eastwood and Lipton, 1997). Higher fertility was found, with a lag, to be associated with increased absolute poverty both through slower economic growth and through a skewing of the distribution of consumption against the poor.

Macroeconomic links are also too elusive to identify because poverty reduction, especially in agriculture, is itself growth enhancing economy-wide. Improvements in farm productivity not only reduce poverty in agriculture, but also create jobs in industries that supply farmers with needed inputs, consumer goods, processing and storage. A recent study of poverty in India concluded that "it is the dog (the rural economy) that wags the tail (the urban sector)". The bulk of India's expanded employment has come from improved agriculture, and this will likely occur for a period to come (Ravallion and Datt, 1996, p. 19).

Microeconomic interactions

Identifying the impacts of demography on poverty using data at the household level is difficult given the lack of information on intra-household resource allocations. While income and expenditure survey data do show a positive correlation between poverty and household size, such simple correlations are hard to assess because they typically fail to account for scale economies in consumption and the age distributions of households (Anand and Morduch, 1995). However, such economies are limited in poor households, where food accounts for up to 80 per cent of consumption.

Fortunately, there is considerable household-level information on educational enrolments and attainments of children—information relevant to assessing both current poverty and its persistence over time. An analysis of dozens of studies relating educational outcomes to household size yields mixed results. There are sizeable numbers of countries displaying positive, negative and statistically insignificant correlations. Where the results are statistically significant, however, a negative impact is most likely; children from large families receive less education. On the other hand, the size of this impact is typically small.[13] Of course, the quality of education received by poor families may well be relatively low, so the somewhat equivocal impacts on enrolment and attainment rates must be qualified.

Such household-level studies of the poor reinforce some of the same realities found in the economy-wide data: there appear to be offsetting and induced responses to demographic pressures (larger family sizes in this case). While in large families greater demands are placed on children to assist with family needs, larger families can be more "efficient" since there is greater latitude for scale economies and specialization in both household production and consumption.

Schooling is no exception since older children can assist younger siblings, and share books and education resources. About the most one can conclude about the impacts of family size on poverty is that intra-family trade-offs are more limited and difficult to make in impoverished families; if adverse net impacts of family size

TABLE V.2. CHANGES IN POVERTY, 1960-1986

Country and period	Length of period (years)	Headcount index		Number of poor (millions)		Average income shortfall (percentage)	
		First year	Last year	First year	Last year	First year	Last year
Brazil (1960-1980)[a,b]	20	50	21	36.1	25.4	46	41
Colombia (1971-1988)[a]	17	41	25	8.9	7.5	41	38
Costa Rica (1971-1986)[a]	15	45	24	0.8	0.6	40	44
India (1972-1983)	11	54	43	311.4	315.0	31	28
Indonesia (1970-1987)	17	58	17	67.9	30.0	37	17
Malaysia (1973-1987)[a]	14	37	15	4.1	2.2	40	24
Morocco (1970-1984)	14	43	34	6.6	7.4	46	36
Pakistan (1962-1984)[a,b]	22	54	23	26.5	21.3	39	26
Singapore (1972-1982)	10	31	10	0.7	0.2	37	33
Sri Lanka (1963-1982)[a]	19	37	27	3.9	4.1	35	29
Thailand (1962-1986)[a,b]	24	59	26	16.7	13.6	..	35

Source: Dennis A. Ahlburg, "Population growth and poverty", in *The Impact of Population Growth on Well-being in Developing Countries*, D. A. Ahlburg, A. C. Kelley and K. Oppenheim Mason, eds. (Berlin, Springer-Verlag, 1996), table 3, p. 226.

NOTE: This table uses country-specific poverty lines.

[a]Measures for this entry use income rather than expenditure.

[b]Measures for this entry are by household rather than by household number.

are to be found, they are likely to be greatest for the impoverished.

It is difficult to separate at the household level the effects of demographic behaviour on poverty from poverty's effects on behaviour. There is evidence from many societies that poor families or households tend to have a larger number of children and also that children in poor families tend to have poorer health and survival probabilities. High fertility may be a rational strategy of poor families in response to conditions of high mortality and to a traditional, low-technology economy in which (unschooled) children can begin to contribute economically at a relatively young age. However, for most of today's poor, current conditions in the surrounding society are substantially different from those of pre-modern times, and are changing rapidly. The available evidence from direct survey questions suggests that in many settings poor, rural and uneducated parents currently want only modestly larger families than their better-off counterparts. The actual difference in fertility levels between the more and less advantaged tends to be much larger than the difference in desired family size: the more advantaged groups have achieved better control over their fertility (United Nations, 1998).

Interactions of population and political economy

In addition to the role of Governments in maintaining a robust macroeconomic environment, it is generally agreed that direct and targeted government policies that expand or redirect resources towards the poor constitutes the most powerful approach to poverty reduction, especially if such policies address the underlying causes of poverty (World Bank, 1990; United Nations, 1997). Implementing these policies has economic costs requiring either an increase in overall production or a redistribution of resources, which is usually difficult to effect. The most promising policies relate to empowering the poor with a stronger means to earn income, such as providing greater access to land, credit, knowledge of farming techniques, health, education and basic nutrition.

Education. To illustrate the political dimensions of the poverty-and-demography link, one might consider how the likelihood of Governments' undertaking policies that expand or reallocate resources towards the poor (and presumably away from the middle class and rich) are affected by the rate of population growth. While speculation on this issue is abundant, neither political theory nor empirical assessment provides a convincing answer. A case study of education provision and its relation to demography is instructive since most agree that improving educational capacity represents a promising poverty-reduction strategy.

It is often hypothesized that rapid population growth not only deters the expansion of education provision (enrolment rates) and reduces schooling quality (e.g., crowding), but also diminishes economic growth since government spending will be shifted away from more productive investments.[14] The poor are likely to be disadvantaged on all accounts. To the surprise of many analysts, several empirical assessments have failed to support these seemingly plausible hypotheses. In spite of exceptional demographic pressures across most developing countries over the 1960s, 1970s and 1980s: (*a*) educational enrolments have advanced dramatically, indeed at a pace unprecedented by historical standards; (*b*) class sizes have

most often declined; and (*c*) the share of education expenditures in GDP (a statistic relating to "crowding out") has been largely unrelated to demographic pressures.[15]

The poor have been beneficiaries of these trends. While these results do not provide the ideal "counter factual"—what government allocations would have been in the absence of population pressures—still, the progress that has been made has been both unexpected and impressive.

Some additional insight into the political dimensions of the relationships between demography and government policies can be obtained by considering education allocations among the primary, secondary and tertiary levels. This issue is critical to the poor, who benefit most from schooling investments at lower education levels. Here the record is mixed. While some countries have emphasized primary education at the expense of secondary/tertiary education, in some the opposite is the norm. These priorities are important since differences in costs per student at the various education levels can be enormous. For example, some countries with high poverty rates (e.g., India) support exceptionally high-cost secondary and tertiary systems, resulting in substantial subsidies to the relatively affluent. These policies are arguably at the expense of the poor.[16] Poverty reduction in these countries will require major changes in Governments' educational priorities and policies.

A relevant issue, then, is the impact of rapid population growth per se on priorities and political decisions. Unfortunately there is no widely accepted theory or convincing evidence that demographic pressures are either causing such education priorities and allocations, or are likely to modify them. Yet government policies in this area can have a major impact on the incidence of poverty. This example illustrates both the importance of elevating research into these policy-demography linkages, and exercising caution in assessing the important political linkages between demography and poverty.

C. Food

Issues relating to food and population linkages are relatively well understood. The agricultural-economics literature on food production and demand, popularized by Malthus (on the production side) and Engel (on the demand side), represents some of the oldest research in economics.

The general consensus (with few exceptions) from the recent research literature is that, with a steady increase in the prudent management of food-producing resources and with an improved and reasonably well-functioning institutional environment, it should be possible to meet food needs in the foreseeable future even under a somewhat conservative scenario of moderate technical change and rising incomes. With the likelihood (assuming active encouragement and support) of fairly rapid technical change, and the possibility of a shift towards a somewhat more caloric-efficient (e.g., a reduced-beef) diet, there is room for guarded optimism. The "ifs" of improved management, diets, technical change and institutions are all feasible but not automatic. These assessments take into account, and are conditioned by, the projected slowing and eventual stabilization of world population. As a result, a stance of cautious optimism that avoids complacency, and active promotion of the conditions necessary for success in agricultural production, represent the most appropriate posture with respect to issues surrounding the balance between food consumption and production. Population policies that enable families to attain their family size preferences will be facilitating as well, reducing the demand for food.

The more important issues appear to relate to problems associated with: (*a*) distributing food within and between countries—largely an issue of augmenting "entitlements" (income and government relief) to the very poor, who are mainly in rural areas; (*b*) creating public-policy environments and rural infrastructure (including research and development, education and health) that facilitate agricultural production; and (*c*) encouraging strategies of environmentally friendly production, that is, "sustainable development".

1. *Food linkages: population and production*

Population's overall impact on agricultural production per capita is both positive and negative. Which force dominates is an empirical issue that varies from country to country and over time.

On the one hand, the traditional framework of Malthus emphasizes the negative force of diminishing returns which holds that, other things equal, population pressing against limited land will eventually result in declining labour productivity and real wages. On the other hand, this negative force can completely or in part be offset, or even dominated by, improvements in technology, expansion of the quantity or quality of land or other factors, and realization of internal and external (e.g., transport) economies of scale. Importantly, these positive forces can be and often are directly caused by the pressures of population growth (Boserup, 1965, 1981; Ruttan 1996). Which demographically induced forces dominate, and under what conditions, have been the thrust of the empirical literature on the analysis of food and population linkages.

To date the outcome has been encouraging. For most of the world's population, diets have improved markedly, consumers have faced declining real food prices over long periods of time, and the incidence of malnutrition has been significantly reduced. Prospects for the intermediate future appear to mirror these trends, although this forecast is not without challenge.[17]

Past and present

World food production per capita has increased by more than 20 per cent over the period 1961-1994. The most rapid increase has been in the developing countries,

where population more than doubled and food calories available per person rose from roughly 1,900 to 2,600 kilocalories per day (a comparable figure for developed countries was 3,000 to 3,200 Kilocalories) (Bender and Smith, 1997, p. 18). The growth of effective consumption was even greater given the reduction in food waste at all levels. While this picture is remarkable, it should be qualified by the sobering reality that the distribution of food was uneven, resulting in malnutrition and starvation in some areas. There was considerable regional variation around these averages: growth in production and daily caloric intake was fastest in East Asia and Latin America, and it languished in sub-Saharan Africa.

Land expansion has constituted a relatively small source of agricultural production in recent decades; intensification (e.g., multiple cropping, land augmentation) and improved technologies and resource use have been the primary sources of food production growth. While there is still abundant cultivable land worldwide, new land is increasingly costly to bring into production, often suffers from poor social overhead capital (e.g., transport), can result in notable environmental costs, and is not located in Asia, the region of greatest population density.

The future

Assessing production possibilities in the future requires a focus on improving the efficiency of existing resource use and on adapting, adopting and discovering improved technologies. Judging whether this will be feasible given population pressures has resulted in a large literature that focuses on carrying capacities and on the feasibility of alternative production and demand scenarios.

Carrying capacity. How many people can the earth support? Serious examination of this question reveals that answers depend on so many apparently reasonable assumptions (e.g., support at what level of well-being? environmental costs to future generations? technology?) that any single evaluation is problematic.[18] The very concept of "capacity" is non-economic: in directing attention to possible physical limits, it sidesteps issues of "command over" and "entitlement to" food and other resources, which are critical for determining actual production and allocation of life's necessities. These considerations justify examining a large number of assessments.

The majority of the more than 50 studies on carrying capacity indicate an ability to feed around 10 billion people (Cohen, 1995, p. 216). Most studies provide worldwide estimates only, and each has its own set of (usually physical) constraints (e.g., land, water, photosynthesis, technology). Many are based on what is physically possible; some attempt to capture an assumed decision-making reality (what farmers and Governments "will" versus what they "can possibly" do); none provides serious behavioural modelling of decisions; and many partake of some political posturing.[19]

From a food-security or a food self-sufficiency perspective, country-specific estimates are required, and these are few in number and problematic in interpretation. The most well-known study (Higgins and others, 1982) focuses on evaluating production capabilities of alternative land types and technology *cum* input bundles. The study demonstrates that: land per se is a relatively unimportant constraint; there are significant variations by country in the relative economic advantages of producing food; and there are great economic benefits of engaging in food trade.[20] Substantive insight by this study into the issue of food security is quite limited since the analysis considers only the limiting case where each country supplies all of its own food. This begs the key issue. In reality, self-sufficiency in the production of food is in many cases an economically costly policy. The relevant issue relates to untangling alternative options for obtaining acceptable food security within the context of a regime of international trade in food. Clearly the urgency of self-sufficiency in food production is much less important to countries with a strong export base (e.g., the major oil producers).

Recent shorter-run projections. For the next one or two decades, world food production is predicted to be broadly consistent with consumption demands according to researchers at several international agencies (World Bank, United Nations Food and Agriculture Organization of the United Nations, International Food Policy Research Institute) (Mitchell and Ingco, 1995; Alexandratos, 1995; Agcaoili and Rosegrant, 1995). An exception to this assessment is provided by the Worldwatch Institute, which predicts severe difficulties and massive famines based largely (but not exclusively) on observed declines in worldwide cereal production per person commencing around 1984, termed a "watershed year" (Brown, 1994).

Qualifications to the Worldwatch assessment illustrate the complexity of analysing such trends and the benefits of disaggregating data at the regional level. One such challenge (Dyson, 1996) observes that European agricultural policies resulted in dumping excess production in the mid-1980s, triggering price reductions and production cutbacks in Northern America and parts of Latin America (e.g., Argentina). Production also initially fell sharply in the economies in transition of Eastern Europe and the former USSR, with a slow recovery projected (Alexandratos, 1995). Combined, these factors substantially accounted for the "watershed" observed in the aggregate data, and they masked important events occurring elsewhere. Indeed, in the largest region (Asia), cereal production per capita actually increased over the period. Africa continued its long-run trend of poor performance, but there was no production watershed observed in the 1980s. In short, the watershed observed in the aggregate data was less the initiation of a long-run trend of production deficiencies worldwide, and more a confluence of special circumstances: developed countries coping with production excesses, and broader economic problems in the economies in transition.

Longer-run projections. For the period up to 2050, several recent studies forecast food production/consumption

balance, but with qualified confidence and notable conditions.

One such study concludes that "serious and persistent global food shortages can be avoided, provided Governments vigorously pursue efforts to improve economic policies and facilitate the dissemination of new technology and investment in research and human resources" (Bongaarts, 1996, p. 499). This study's six key assumptions exemplify the choices and conditions that must be met. Specifically, the study, which applies to the developing world, posits: (*a*) an increase in caloric intake per capita of 30 per cent over the next 50 years; (*b*) a 10 per cent shift from grains to animals; (*c*) an annual yield increase one half that of the previous 30 years (1.1 per cent versus 2.1 per cent per year); (*d*) a productivity increase in arable land use of 0.17 billion hectares (there are now 2.2 billion in forests and wetlands); (*e*) cropping frequency comparable to currently dense countries; and (*f*) a small percentage increase (5 per cent) in trade (this is fairly large absolutely, given the growing agricultural base). Of course, there are other combinations of the above assumptions that would achieve the same overall result. Many trade-offs are possible.

Another recent study (Smil, 1994) arrives at the same overall food balance conclusion, but highlights an initial strategy of relying on well-documented possibilities for increased production efficiencies in the utilization of existing (not expanded or new) resources and technologies.[21] This involves adopting better agronomic practices; reducing irrigation waste, post-harvest losses, and end-use consumption/production waste; and improving diets (a modest reduction in fat intakes). Such strategies would expand food available enough to feed 8.4 billion people at 1990 diets, or 7.7 billion at improved diets. A secondary strategy of expanding land use, fertilizer use and other resource-augmenting techniques would be sufficient to meet population food needs to 2050 and beyond. Of course, the first strategy does indeed involve significant costs and a compatible institutional setting.

The greatest uncertainty in appraising future food production capacities relates to the pace of adopting and adapting existing technologies and of discovering new technologies. This relates in part to the availability of complementary resources, the capacities to finance them (including credit to small farmers) and an institutional setting (land security and favourable government pricing, taxing, research and development, and agriculture extension policies). Analysts of these processes (e.g., Ruttan, 1996) observe that improvements in yields observed in the past were extraordinary and are unlikely to be sustained in the future. Indeed, there are signs of diminishing impacts and rising costs of inputs (fertilizers, water). Moreover, the costs of advancing technologies will require substantial financial and government support, and must include a broad strategy of investing in human capital (education and health).

Even given these qualifications, most analysts are "cautiously optimistic" about agricultural prospects (Ruttan, 1996, p. 168). Some regions (sub-Saharan Africa, in particular) and some groups of people (the impoverished) will continue to struggle. Of the latter, the problem relates more to food distribution and entitlements and less to food production per se. Critical to agriculture's success, however, will be prudent management, considerable innovation supported by agricultural research, spread of modern technologies and, likely most important, facilitating government policies. These conditions are neither automatic nor costless.

Moreover, even these conditions may not be sufficient to cope adequately with some of the environmental costs of extensive expansion of agricultural systems. These costs include deforestation and biodiversity loss, soil loss, overexploitation of water resources, and pollution from fertilizers and pesticides. Impacts on greenhouse gas emissions must also be recognized: increased carbon dioxide from deforestation, fuel use for farm machines and transport, nitrous oxide from fertilizer, and methane from rice paddies. While the capacity to provide sufficient food, albeit with notable modifications in government policies and with substantial investments, is a feasible and even a likely outcome, the toll on the environment must be considered.

D. THE ENVIRONMENT

Interactions between demographic change and the environment are complex and pervasive in scope. They vary by the resource considered, the institutional setting, and the stage of economic/political/social development.

Environmental overuse and degradation takes many forms, including the polluting of air and water; the imprudent use of land, forests and other renewable natural resources; the reduction of biodiversity; and the build-up of wastes, including greenhouse gases. In assessing the relationships between population and the environment, it is critical to isolate the fundamental causes of environmental problems. This is difficult given the large number of factors that condition such relationships.

1. *Analyses of the environment*

Complex interactions. A recent study highlights the complexity of population-environment interactions (Hempel, 1997). It highlights eight factors as central to studying environmental problems. It begins by citing two core values that expose profound ethical issues: (1) anthropocentrism, the self-centred behaviour of man that sacrifices species to satisfy wants, and (2) contempocentrism, insufficient regard for future generations. Two consumption patterns are stressed: the existence of significant (3) affluence and (4) poverty. Affluence is associated with extensive consumption of non-renewable energy, diets rich in animal protein, automobiles, land and building materials.[22] Poverty is associated with extensive water contamination, over-exploitation of fisheries and

forests, land degradation and air pollution (the burning of biomass, in particular).

Two factors are isolated as substantially governing the extent of resource overuse: (5) the degree of market failure, where prices do not properly assess the appropriate costs of environmental use, and (6) the outright failure for markets to exist (e.g., overfishing as a "tragedy of the commons"). Two factors, (7) technology and (8) population growth, are singled out as "amplifying" the extent of environmental spoilage. Of these, technology is most important. Population growth can have small or large impacts depending on the nature of the more fundamental factors noted above. Population size per se is considered less important for affecting the environment than people's behaviour, which derives from the setting in which they live (Shaw, 1989; Bilsborrow, 1992).

Such a taxonomy is just one of many possible. It reveals the complexity of the underlying relationships and places one's interpretation of population's role in perspective. To more fully expose the underlying relationships, three features of environmental problems merit elaboration: market failures, policy failures and poverty.

Market failures. Markets ration most "individually owned" resources reasonably well by determining an exchange "price", which incorporates both the demand for a resource, and its "costs". In contrast, many renewable environmental resources possess the property of being owned "in common", so that there is little incentive for individuals either to reveal their preferences or to conserve. Markets can therefore fail where property ownership rights (and other conditions) are weak or absent.[23] Environmental resources will be overused since their intrinsic values are understated and their effective price is too low.

This market failure necessitates correction by modifying the causes of its existence (e.g., by assigning secure property rights), and/or by devising alternative methods of resource allocation. Such methods require groups (social and usually governmental) to establish rules designed to modify individual behaviour and often to impose taxes and subsidies to reconcile individual and group values for an environmental resource. Short of such corrections, environmental spoilage and overuse will tend to occur. Moreover, the faster the pace of population growth (an amplifying factor), the more rapid the pace of overuse. Population's role will be much smaller if mechanisms for properly valuing environmental resources are in place. This is rarely the case in low-income countries, where the rate of population growth, market distortions and environmental degradation are all high (Panayotou, 1994).

Policy failures. Appropriate public (or collective) policies represent the key to moderating environmental problems. Unfortunately, policy failures are pervasive and largely account for environmental problems worldwide. These failures are of two types: direct failures through neglect of environmental requirements, and indirect failures through the unintended side effects of seemingly unrelated policies on the environment.

While attention is typically focused on direct failures (e.g., underpricing logging rights), indirect failures are often more important. These include a long list of policies that disadvantage the rural sector: overvalued exchange rates, urban bias in service provision, underinvestment in rural infrastructure and research and development, taxation of farm inputs, and constrained farm prices. These policies perpetuate rural poverty and actively encourage farm practices that overuse a relatively cheap resource—the environment.[24] It is not a coincidence that poverty is especially prevalent in the rural sector and that environmental spoilage is directly linked to poverty. Both are substantially caused by the same force: policy failures.

Poverty. "The poor are both the victims and agents of environmental damage" (World Bank, 1992, p. 30). In some rural areas the poor rely on natural resources over which they have little legal control, so that they have weak incentives to preserve or conserve. Their time perspectives are of necessity shorter since day-to-day survival dominates their behaviours. Extensive use of environmental resources, considered imprudent or excessive from society's perspective, is fully rational for poor farmers given their urgent requirements and the institutional setting in which they find themselves.[25] Children are especially valued in such a setting to fetch water and firewood, necessities for existence. The poor can be trapped in an unstable "vicious circle" of worsening interactions between their needs and the environment upon which their survival depends.

However, this vicious circle can become virtuous if development includes not only economic growth, but also social development and innovation and advancement in political institutions and policies (Lutz, 1998). In many instances policy change is virtually a prerequisite to resolving environmental problems, long-term. Robinson and Srinivasan (1997) convincingly argue that "there are strong complementarities between policies to improve the environment, influence population growth and promote development in general" (p. 1179), and that "inappropriate government policies and institutions are frequently to blame for environmental stress" (p. 1180). In contrast, appropriate policies cause (even poor) farmers to use environmentally friendly farming techniques that raise productivity and income; to invest in human capital and environmental resources; and to reduce family size. It appears that the nexus between poverty, environmental stewardship and population growth can result in a reinforcing web of either positive or negative outcomes, depending critically on the policy environment, institutional setting, the nature of governmental interventions and access to markets (Boserup, 1965; Heath and Binswanger, 1998; Panayotou, 1994).

2. *Agriculture and deforestation*

Farming is a principal route by which humans interact with the environment. This primarily involves transform-

ing land between uses (e.g., forests to crops) and modifying the intensity of land use.

Extensification. Deforestation constitutes the most conspicuous example of environmental change in farming. While the rate of deforestation is uncertain,[26] studies across many countries and ecological settings reveal a positive correlation between deforestation and population growth (Bilsborrow, 1994; Birdsall, 1994; Palloni, 1992). The strength of these correlations varies substantially between settings and depends on factors such as access to and ownership of land, restrictions on foresting, the relative economic attractiveness of using intensive versus extensive cultivation techniques (strongly influenced by land tenure and government policies), and the like.

Intensification. Many irrigated areas are currently under ecological stress, associated in part with the advent of new technology packages of seeds, fertilizers and pesticides. Upwards of 25 per cent of the arable land under irrigation is threatened by problems of water deficiencies, salinization and pollution (Waggoner, 1994). Soil degradation is increasingly commonplace. While water is often over- and ineffectively used (largely because it is "underpriced"), and while there are many opportunities and environmentally friendly methods of conservation possible, the institutional mechanisms for implementing effective water management can be time-consuming, costly and, in some settings, not feasible. Population pressures per se are thus not the only, or necessarily even the primary, cause of ineffective water use and related pollution, but they exacerbate the pace of ecological damage.

3. *Industry*

Pollution of air and water, largely by industrial processes, constitutes the primary mechanism of environmental damage in developed countries, and increasingly in developing countries as their economies are transformed from agricultural to secondary and tertiary production. Isolating and accounting for the specific impacts of population growth on industrial pollution has often been carried out using the formula: $I = PAT$, which attributes the growth of pollution (I_{gr}) to the growth of (*a*) population (P_{gr}); (*b*) affluence (usually measured as the growth of gross national product per capita, GNP/P_{gr}); and (*c*) technology (the growth of pollution per unit of GNP, i.e., $T_{gr} = I/GNP_{gr}$).

This formulation must be used with care. It is an accounting identity not well designed to expose the underlying causes of pollution. The limitations of the framework are several. First, it must be evaluated on a regional, or preferably national, basis since the key determining relationships vary enormously from place to place: e.g., pollution technologies are less effective in low income countries; per capita fossil fuel use is higher in high income countries. The compilation of world estimates based on global averages that fail to account for regional differences has resulted in notable errors in the analysis of the impacts of demography (Myers, 1994). Indeed, one study reveals a 400+ per cent overstatement of the impact of population growth by failure to account for region-specific differences in emission patterns (Lutz, 1992).[27]

Second, the choice of demographic unit of analysis as between, for instance, "population" versus "households", can have a notable impact on the assessment of population's effects (MacKellar and others, 1995). For example, if large households are smaller users of energy on a per person basis than small households, then slowing population growth, which results in smaller household sizes, can result in per capita increases in some forms of pollution.

Third, the PAT model assumes that the increases in the right-hand-side variables are independent of each other. In fact, they are systematically correlated and causally related. Thus: (*a*) population growth arguably has an impact on per capita output growth; (*b*) population growth declines with rising levels of affluence (the demographic transition); and (*c*) rich countries tend to employ less polluting technologies, although this depends on the measure of environmental quality (Grossman, 1995).

One recent study that uses statistical methods to account for these three interactions in several forms of pollution (carbon dioxide, carbon monoxide, nitrogen oxide, pesticide use and nitrogen fertilizer use in agriculture) finds that demography has a relatively small impact (in OECD countries): "in accounting for variation in changing levels of environmental hazards produced by industrial processes, population growth is destined to play a minor role" (Preston, 1996, p. 105). More studies of this framework using data from developing countries are needed before generalizations can be formed.[28]

However, across most studies, it appears that choice of technology is the key determinant (Commoner, 1994) of industrial pollution and that demography plays a relatively modest role. The technology choice is influenced not only by level of prosperity (poorer countries employ less costly but more polluting processes), but also reflects political choices that stress goods over the environment, a choice, incidentally, that currently developed countries also made at earlier stages of economic development.

4. *An emerging synthesis and consensus*

These results highlight the relevance of two perspectives: first, environmental problems are qualitatively different between developed and developing countries; and second, the roles of Government in promoting environmental sustainability are somewhat different between these settings, but central in both cases.

In contrast to developed countries where environmental concerns focus on waste disposal, pollution and, to a certain extent, concern about the global commons (e.g., CO_2), in developing countries environmental problems relate to air pollution from biomass burning, inadequate

sanitation, water contamination, and land and forest spoilage. In terms of human suffering, these environmental deficiencies in developing countries may be the most serious facing the world today.[29]

As is discussed in box V.1, many Governments, especially in the less developed regions, have come to regard population factors as contributing to their environmental problems, though measures to influence population

BOX V.1. GOVERNMENT VIEWS REGARDING POPULATION AND THE ENVIRONMENT

By the time of the United Nations Conference on Environment and Development (Rio de Janeiro, 1992), concern about the environment had risen to the top of the international agenda, prompting renewed attention to population issues and their relationship to environmental problems. At the Rio Conference and at the International Conference on Population and Development (Cairo, 1994), a consensus was established that population, environment and development were inextricably linked. It was also recognized that bringing about a sustainable relationship between human numbers, resources and development required activities at all levels, from local to global. The centre of this consensus was the realization of the global nature of the most salient environmental issues. At the same time, many Governments have become acutely concerned about local and regional environmental problems within their own boundaries.

Government views on population and the environment were reviewed in a recent report by the Population Division (United Nations, 1997), based primarily on national reports and statements at successive intergovernmental conferences on the environment and on population, and through the consensus statements and recommendations adopted at the conferences. That report traced an evolution from earlier conferences, where population issues and environmental concerns tended to be discussed in isolation, to more recent ones, where linkages of population, environment and development issues have been explicitly recognized. The report found that, by the time of the Population Conference in 1994, at least 80 countries had expressed concern about increasing population-environment imbalances: "Over 70 per cent of the national reports prepared for the [Rio] Conference cited population pressure on the environment as causing concern, especially in urban areas, and in connection with land degradation, deforestation and the precarious state of fragile ecosystems" (United Nations, 1997, p. 2).

Population factors are more often seen as problematic for the environment in the less developed than in the more developed regions. The more developed countries are less likely to report that population is "not a concern" at all, but they are substantially more likely than the developing countries to report that there is no official position on the matter. However, even among the more developed countries, there is concern regarding population impacts on the environment.

Water pollution, the amount of fresh water and deterioration of the urban environment are the areas over which serious concern is most often expressed regarding population impacts. Rarely do Governments seek a solution to environmental problems solely through altering population trends of distribution. In many cases, though, Governments report a policy approach that combines measures to affect population with other approaches to alleviating environmental problems.

Perhaps the specific area that stands out from the new evidence more than from the earlier review cited above (United Nations, 1997) is the serious concern in most developing countries over population factors in relationship to both the amount and the quality of fresh water. This does not necessarily mean that the concerns developed only recently, as the reports and statements reviewed earlier may simply not have stressed the population linkage.

Many Governments view population trends as contributing to national environmental problems. Especially in developing countries, population's role is often viewed as a serious concern. The urban environment and the adequacy of water supplies (both amount and quality) are the environmental areas where population impact is not often seen as serious. However, effects of size or trends were viewed with some degree of concern by a majority of countries that provided information, for every environmental issue mentioned.

growth and distribution cannot be expected by themselves to solve those problems.

The linkages between government policies and population pressures are complex and incompletely understood. Fortunately, the centrality of public policies to environmental matters, and the forms of their implementation, are being recognized and increasingly addressed by international institutions. Emphasis is shifting from "scarcity" of environmental resources to a recognition that their rational use involves effective public policies. The role of population is also being put into perspective. Population pressures are but one factor in the complex of determinants of actual and optimal environmental resource use. Slowing population growth will diminish the pace of environmental degradation. However, whether such an outcome will in fact facilitate urgently needed policy action is, as emphasized in other contexts above, quite uncertain.[30]

The *World Development Report, 1992* on the environment highlights this reorientation: "the environmental debate has rightly shifted away from concern with the *physical limits* of growth, toward concern about incentives for *human behaviour* and policies that can overcome *market and policy failures*" (p. 10). In the area of environmental management, as in the areas of providing sufficient food and eliminating poverty, the impacts of demographic change are mainly to amplify effects of other factors. Population policies are, therefore, part of the broader policy-making components that are needed to advance economic development, eradicate poverty and foster long-run environmental stewardship.

E. Conclusions: Population Policies in Perspective

Economic growth and poverty. Debates surrounding the consequences of population growth for the pace of economic development are both vigorous and contentious. Recent decades have witnessed major swings in thinking about population and development interrelationships. In general, the impacts of rapid population growth have been judged to vary considerably by country and over time, and have been considered to be relatively small by comparison with other determinants of economic prosperity. Nevertheless, there is a general view that the rapid population growth of many developing countries makes it more difficult for these countries to achieve rapid improvements in their standard of living. The Programme of Action of the International Conference on Population and Development reflected a consensus that slower population growth buys time for Governments to adjust. However, slowing population growth does not itself ensure that favourable policy and institutional changes will occur. The time "bought" by slower population growth may be squandered if needed policy changes are not made.

Even though poverty headcount rates have declined dramatically in many countries in recent years, over 1.3 billion people are still classified as poor, and economic downturns that began with the Asian financial crisis in 1997 have reversed some of the gains. It is widely believed that the most important factor accounting for poverty is the macroeconomic environment, and especially factors that govern the growth of employment. To the extent that macroeconomic growth is adversely influenced by the pace of demographic change, then poverty will be adversely impacted by rapid population growth as well.

Public-sector programmes targeted towards the poor have contributed to reductions in poverty in many countries. The most important example has been publicly supported education that emphasizes the lower grades. Important to further progress in poverty reduction will be continuing improvement in the quality and scope of education provision, as well as efficient delivery of primary medical services. While reduced population growth will buy time to improve the health and education of the poor, such time can be squandered.

Food security. Even though the expansion of food available per person in developing countries has grown at an impressive pace in recent decades (from 1,900 to 2,600 kilocalories per day), and total food production has more than doubled, the distribution of food has been uneven and starvation and malnutrition is still pervasive, especially in Africa and parts of Asia.

In the face of notable demographic pressures in the future, a comparison of population with carrying-capacity estimates indicates that persistent food shortages can be avoided, if there are improvements in and prudent management of rural-sector production. There are notable possibilities for low-cost improvements in storage, transport and utilization of existing technologies; and advances in technologies are expected, and movements towards more calorie-efficient diets are possible. However, advances in science per se will not by themselves solve the problems. The provision of stronger rural infrastructure and institutional settings (roads and communications, credit, research stations, pricing and taxation policies) and human investments in education and health, including reproductive health, are also important for meeting food needs. These facilitating conditions are neither automatic nor costless. An important element in food provision is the need to take account of growing environmental costs. While these can be large, they can also be attenuated by appropriate government policies.

Environment. Even though recent decades have witnessed significant degradation of environmental resources (e.g., rain forests, soil, water), fortunately individual countries and international institutions are increasingly recognizing the nature and causes of environmental problems, and the need for appropriate policies for environmental management. Environmental debates have moved to reasoned perspectives that assess the underlying causes and consequences of environmental use in a way that provides a needed reckoning of benefits and costs.

The growth and distribution of the population has direct impacts on environmental use, but the nature of these

impacts is largely governed by institutional realities —property rights, land distribution, taxes and subsidies on various types of production and consumption, and the like. Given the nature of environmental resources, government policies are critical to population-environmental interactions. Because market and policy failures are extensive, seemingly adverse impacts of population growth can be high, although slowing population growth may not halt environmental decay, and the impacts in many settings may in reality be relatively small. That is because, without government policies that correct market failures and provide incentives for appropriate individual/firm behaviour, environmental degradation will continue, albeit at a reduced pace. And the possibility of increased economic prosperity associated with reduced population growth can itself carry with it pressures on the environment. Thus, the impacts of demographic change can best be viewed as "amplifying" the impacts deriving from the more fundamental causes of environmental degradation.

In summary, poverty reduction, food provision and environmental use are integrally linked with economic, demographic and political change. "Vicious circles" of cumulatively worsening performance in each of the latter two dimensions may be exacerbated by rapid population growth. Government policies that promote income growth, empower the poor with education and health, and provide incentives to behave prudently in the allocation of resources can help to break this circle. Such policies can lead to "virtuous circles" of cumulatively improving performance in all three dimensions. In such a situation, children are less likely to be seen as producing agents, women's and men's roles change, and the demand for reproductive health services increases. Economic and demographic change are mutually interacting forces influenced by institutional settings and government policy. Population policies are an important element of the policy-making components needed to advance economic development, eliminate poverty and foster long-run environmental stewardship.

NOTES

[1]See, for example, Meadows and others (1972); Coale and Hoover (1958); National Academy of Sciences (1971); Ehrlich (1968); Barney (1981).

[2]This perspective is sometimes called "revisionism". It is not primarily distinguished by whether the net assessment is negative or positive, but rather by the methodology that emphasizes a more complete reckoning of the impacts of demographic change.

[3]An early discovery of the finding was presented in United Nations (1988). See also Bloom and Freeman (1988); Barlow (1992); Blanchet (1991); Brander and Dowrick (1994). A statistical assessment of these studies is found in Kelley and Schmidt (1994).

[4]Kelley and Schmidt (1994).

[5]Such issues have been debated at recent international conferences, including the World Food Summit in 1996, the United Nations Conference on Human Settlements (Habitat II) in 1996 and the World Summit for Social Development in 1995.

[6]The figures are in 1985 purchasing power parity dollars. Advantages and limitations of the measure are taken up by Chen, Datt and Ravallion (1994). Alternative measures are examined in United Nations (1997); World Bank (1990, chap. 2); Sen (1985); Ravallion (1992); and Lipton and Ravallion (1993).

[7]Deprivation measures are discussed in United Nations Development Programme, *Human Development Report 1994*, and in Sen (1985, 1987).

[8]For a recent assessment of the determinants and correlates of poverty, see Lipton (1998).

[9]Blank and Blinder (1986); Squire (1993); Chen, Datt and Ravallion (1994); Lipton and Ravallion (1993).

[10]Eastwood and Lipton (1997) find the adverse distributional impacts for 1980s macroeconomic trends to be quite large.

[11]Ahlburg (1996, p. 219) concludes: "Little direct evidence on the impact of population growth exists"; McNicoll (1997, p. 2) observes "that view [of a poverty, birth-rate association] finds little support in the extensive statistical research literature". The UNFPA consultative group (United Nations Population Fund, 1991, pp. 50-51), concluded that "Research has not established a strong causal link running from high fertility to poverty". Pritchett (1997, p. 51) adjudges that solid evidence showing population growth to be "a cause or even an exacerbating condition of poverty" cannot be given "because there is none". For a recent important exception to these assessments, see Eastwood and Lipton (1997).

[12]Ahlburg (1996) argues that while direct policies like land redistribution are much stronger than population policies in poverty reduction, family planning should play a role since such programmes are politically easier to implement.

[13]This is consistent with Kelley's (1996) review of 36 econometric studies. A somewhat less equivocal interpretation is provided by Lloyd (1994). It should be emphasized that the entire literature, almost without exception, is flawed by failing to account for simultaneity in the family-size/education relationship, and for the likely non-linearity of the education/family-size relationship.

[14]The classic statement is by Coale and Hoover (1958).

[15]While costs per student have declined in some regions, this may not have significantly impacted education quality, since cost trends are mainly due to slowly growing teacher salaries, explained by labour market conditions. (These trends may also result from the hiring of a large cohort of relatively inexpensive younger teachers.) See Schultz (1987, 1996); Kelley (1996). Schultz's results for the 1960s and 1970s cause him to observe: "This finding challenges the working assumption of Coale and Hoover (1958) that linked population growth to the share of income allocated by poor countries to 'less productive' expenditures on education and social welfare programs" (1987, pp. 458-459). Kelley's updated results (1996, pp. 79-80) for the 1980s confirm Schultz's findings.

[16]A case study of East and South Asia is provided in Tan and Mingat (1992). In contrasting the Republic of Korea and India in the mid-1980s, pupils per teacher in primary, secondary and tertiary are 38 vs. 58, 34 vs. 20, and 41 vs. 16, respectively. India's resource allocations, corroborated by other statistics, are meagre for lower and generous for higher education levels.

[17]A recent study summarizes the situation in the intermediate run: "If Malthus is ultimately to be correct in warning that population will outstrip food production, then at least we can say: Malthus Must Wait" (Mitchell and Ingco, 1993). For a pessimistic assessment, see Brown (1994), and for a challenge to that assessment, see Dyson (1996).

[18]United Nations Population Fund (1991, p. 71) defines carrying capacity as "the number of people that the planet can support without irreversibly reducing its capacity or ability to support people in the future". It offers several detailed case studies applying this concept, each of which appropriately depends on upwards of a dozen fundamental qualifications conditioning the application of the definition.

[19]"Most published estimates ... are probably less dispassionate analyses than they are political instruments, intended to influence actions one way or another" (Cohen, 1995, p. 233).

[20]This study provides estimates of regional self-sufficiency for the year 2000 based on low- and high-input alternatives. All regions are self-sufficient in the year 2000 at the high-input level, and all save South-west Asia at the low-input level. Thus, intraregional trade would broadly accommodate country-specific food needs.

[21]"Technologies" vary from capital-intensive methods that use high-yield seeds with modern fertilizers and pesticides, to labour-intensive techniques that use "green" methods of soil preparation, water conservation methods, and harvesting/storing formats to reduce waste.

[22]Myers (1997) highlights the propensity of the affluent to "use up" (not simply use) environmental resources, a result largely of market failure. He alleges that a $7 per gallon tax on gasoline would be required to internalize the costs (even exclusive of CO_2 effects) associated with the "car culture". Keyfitz's writings (1996, 1976) have exposed in detail the issues of consumption and the myopia of economic analysis.

[23]For markets to function well, property rights must be clear and secure, actions should have no significant negative side effects, competition should prevail, public goods should be minor exceptions, and myopia, uncertainty and irreversible decisions should not arise (Panayotou, 1993, chap. 2).

[24]Lists of policy failures, with scores of examples, are provided in World Bank (1992) and Panayotou (1993).

[25]Given a proper institutional setting and incentive structure, poor farmers are excellent stewards of the environment.

[26]Rapid deforestation is a recent phenomenon. Globally forested areas have declined by 20 per cent over a period of many centuries (Miller, Reid and Barber, 1991). The present pace is exceptionally rapid by historical standards. Most developing countries are losing forest cover (between 1978 and 1988 the Amazon lost 4 per cent of its closed canopy), and species loss and threats are proceeding at an even faster rate (Skole and Tucker, 1993). See also Robinson and Srinivasan (1997, p. 1191).

[27]CO_2 trends are illustrative. Globally per capita CO_2 emissions have been flat for the last three decades. Growth of CO_2 might thus be attributed mainly to population increase. However, in developing countries there has been a sixfold increase in per capita emissions in the last 45 years, so the impact of population growth there is relatively small (Meyerson, 1998, pp. 117-118).

[28]Bongaarts (1992) projects that 35 per cent of CO_2 emissions between 1985 and 2050 will be due to population growth, a result sensitive to the rate of deforestation deriving from population pressures. Much higher estimates of population's role are provided by the United Nations Population Fund (1991). For qualifications, see Harrison (1990), Shaw (1989) and Horlacher and Heligman (1991, p. 361).

[29]One billion people lack access to clean water and 1.7 billion lack access to sanitation. At least 2 million child deaths are directly linked to these conditions; 300 million to 700 million women and children suffer from severe indoor air pollution from cooking fires (Robinson and Srinivasan, 1997, pp. 1179 and 1189).

[30]In terms of policy emphasis, one perspective is offered by Jha, Deolalikar and Pernia (1993, p. 25): slowing "population growth by itself is unlikely to halt or even slow the rate of environmental degradation and depletion of forest, marine and water resources. Other policies that limit access to common property resources manage rural-urban migration, regulate greenhouse gas emissions, and eradicate poverty will be needed. However, rapid population growth will certainly make it more difficult for countries to improve the environment with a given set of policies and interventions." Contrasting perspectives and qualifications are offered by Shaw (1989), Birdsall (1992) and Ahlburg (1996), who recognize the subsidiary role of demography but argue that population policies are cost-effective and, given the political difficulties of effecting needed institutional/political changes to improve economic growth and environmental sustainability, are relatively feasible.

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APPENDIX

Basic data collection, data availability and data quality

This appendix reviews the major sources of data on size and structure of population and components of change. The primary data-collection systems for demographic and social information are population censuses, civil registration systems and sample surveys. Although these systems use different techniques and serve different purposes, they are complementary and are part of any complete data-collection system designed to provide the full range of population statistics needed for a comprehensive understanding of demographic development and for research purposes. These systems have, for example, provided the primary means for measuring basic demographic parameters such as size and growth of population, components of growth and vital rates. Besides these, other relevant sources of demographic statistics include immigration and emigration statistics and such statistics as school enrolment, residential building permits and registered voters. In some countries population registration has replaced population censuses as the preferred source of information on population size and structure. The selection of the appropriate type of collection system depends upon its usage. Marks, Seltzer and Krotki (1974) provided guidance on considerations involved in this choice, including trade-offs between various alternatives that should be kept in mind while deciding on an appropriate data-collection approach.

The annex, in focusing on sources of demographic statistics, (*a*) reviews the progress of census-taking and its role in producing demographic data during the last several decades; (*b*) provides a brief overview of the use of household surveys to obtain measures of fertility and mortality statistics in the absence of accurate and timely vital statistics; and (*c*) concludes with a discussion of administrative records for collecting vital statistics and international migration statistics.

A. POPULATION CENSUSES

A population census, customarily taken decennially or quinquennially, is: "the total process of collecting, compiling, evaluating, analysing and publishing or otherwise disseminating demographic, economic and social data pertaining, at a specific time, to all persons in a country or in a well-delimited part of a country" (United Nations, 1998a). The key features of a census include individual enumeration of all units, universality within a well-defined territory, simultaneity and periodicity. Compared to surveys, population censuses can provide detailed data for small geographic areas and results that are not affected by sampling error.

A population census is a major source of many of the broad macro-level indicators required to measure/monitor progress in the areas of population and development, and public policy. It has provided primary data for the construction of many social and economic indicators, including school attendance, education levels attained and literacy levels; employment and unemployment; and for the measurement of progress in achieving gender equality.

1. *The 1980 and 1990 rounds of censuses*

Over the last five decades since its inception, the United Nations, through the United Nations Statistics Division, in collaboration with other United Nations organizations, particularly the United Nations Population Fund (UNFPA), has played a key role in promoting census-taking around the world. It has developed and coordinated programmes to strengthen national capabilities in census-taking and to promote comparability among countries and across time, and it has encouraged countries to standardize systems for reporting census results.

Census coverage and content has improved substantially over the last three decades. In the 1980 and 1990 rounds of censuses, for example, the population enumerated in censuses increased from 80 per cent in 1965-1974 to 94 per cent and 95 per cent in the 1980 and 1990 census decades, respectively. Table A shows the number of countries that conducted a census during the last five decades. Although content varied over time and from country to country depending on the needs of each country, generally speaking, collection and processing of demographic and socio-economic data improved over the years.

An overall improvement in many phases of census-taking, particularly in regard to data processing and dissemination, occurred during the 1990 round of censuses, owing to the widespread adoption of new technologies by developing countries. The rapid development of computer technology and the wide availability of data-processing software have considerably reduced the time lag between census enumeration and release of the census results. Microcomputers have played an important role in census planning and organization in a number of countries, particularly in data entry, data processing and tabulation, census publication and data dissemination.

Regarding precision and accuracy of topics investigated in the population censuses, there are areas that need improvement, especially those related to population dynamics such as fertility and mortality. Great efforts were made in the past few decades to redesign the questions and develop new techniques to deal with measurement of these issues. Generally speaking, countries whose data suffer from inaccuracies in a census are also the countries that lack a good registration system. This topic is further discussed in part C, below.

2. *The 2000 round of censuses*

In preparation for the 2000 census decade, *Principles and Recommendations for Population and Housing Censuses: Revision 1* (United Nations, 1998a) was updated based on country experience and technological advancement. The use of microcomputer technology in census-planning, operations, data processing and data dissemination was incorporated. New topics such as disability, new items in housing and new classifications of economic and educational characteristics were included in the revised publication. A new section on census products and data utilization was added to emphasize the importance of taking users' needs into account in the planning as well as dissemination phases and to inform users of the importance of participating actively in census activities, beginning with the planning phases, in order to ensure that the needs for statistics and indicators are met.

Owing to the rapid change in trained personnel in census organization, considerable efforts are needed to successfully implement the 2000 round of population and housing census programmes, even though countries have gained substantial experience in census-taking over the last two to three decades. Realizing that better documentation of census-taking experiences will enhance the capability of a census organization in implementing census activities, a series including four handbooks is in preparation to complement those produced for the 1990 decade (United Nations, 1992a; 1992b; 1996a). A handbook on geographic information systems (GIS) and digital mapping for census activities gives an overview of GIS definitions, concepts and capabilities and also focuses on new technologies used in census cartography before, during and after the census by providing theory, hands-on experience and examples of actual work regarding digital mapping. A second handbook on population and housing census edits is designed to provide guidance for editing errors introduced at the enumeration stage, and during the field-editing, data-coding and data-capture stages. The handbook focuses on the subject-matter specialist in order to serve as a basis for dialogue between these persons and data-processing experts regarding the need for edits and the type of editing system that provides

TABLE A. NUMBER OF COUNTRIES HAVING CONDUCTED A CENSUS DURING THE 1950, 1960, 1970, 1980 AND 1990 CENSUS DECADES, BY REGION

Census decades	*Total*	*Africa*	*North America*	*South America*	*Asia and Oceania*	*Europe*
1985-1994[a]	200	46	33	13	68	40
1975-1984[a]	209	51	33	13	69	43
1965-1974	162	36	34	12	53	28
1955-1964	85	9	12	9	26	35
1945-1954	65	2	12	8	15	28

Sources: *Demographic Yearbook* (United Nations, 1965, 1985b and 1996b); Forest E. Linder, "World demographic data" in *The Study of Population* (Chicago, University of Chicago Press, 1959).

[a]Number of countries or areas conducting a census in the 1980 and 1990 census decades is based on the number of countries at the end of April 1994.

the required results: It includes country experience and advice on widely used software and sample edit specifications. A third handbook on census management presents ways to manage the entire census process beginning with attention to user needs, planning the census, quality assurance and, at various stages, preparation, collection, field operations, data processing, census products and evaluation. A fourth handbook, "Guide for the collection of economic characteristics in population censuses", is in preparation for improving the use of census data on economic characteristics in a programme that integrates surveys and censuses. Interregional and regional seminars are planned for census managers to address issues raised in the *Principles and Recommendations for Population and Housing Censuses: Revision 1* (United Nations, 1998a), to strengthen the capacity of the national census offices in applying new developments and technologies in census operations and to improve the efficiency of producing population and housing census statistics in a timely fashion.

In recent years new problems have emerged that impede continued improvements in census operations. One major problem countries face is the escalating cost of the whole census operation. Cost of data collection for censuses has increased rapidly during the last decade and has become a major obstacle for census undertaking not only in the developing countries but also in the developed world. For example, the European Union held several meetings and workshops to study alternative methods of producing census data in less expensive ways, such as using administrative records as a replacement for traditional census-taking (EUROSTAT and Statistics Finland, 1995). The situation in the rest of the world regarding census costs is even worse.

Another major issue is that of privacy and confidentiality. As a result of technological development and the wide use of databases, information stored in the census database for specific areas can be retrieved for an individual unit, which may be utilized for non-statistical purposes. It is therefore important that the maintenance of confidentiality and protection of individual privacy be considered when planning for data collection and data dissemination.

In spite of the substantial experience in census-taking over the last three decades, a major problem facing developing countries is the rapid turnover of experienced staff in census and statistical offices. Considerable efforts, particularly in training and in retention of trained staff, are needed to successfully implement the 2000 round of population and housing census programme.

According to recent information regarding planned population censuses, around 185 countries are planning to conduct a population and/or housing census during the 2000 round census decade. However, it is unclear whether many countries will meet the financial and technical requirements for successfully carrying out their censuses. The high costs of conducting censuses coupled with shrinking public-sector budgets have placed the future of census-taking in question. It would thus be advisable for countries to look at census costs more critically. In Africa, for example, some countries have already postponed their censuses in order to secure the required census budget. Moreover, the future of international assistance for data collection to these countries is ambiguous. Under these circumstances, fewer countries may conduct a census during the 2000 census decade than in the 1990 census decade.

A compromise between full count and use of sampling may be an appropriate solution. This arrangement is appealing given the present level of technological development in computers, which will assist in processing and weighting the figures. Another solution is to limit the census questionnaire to basic questions, such as sex, age, place of residence and relationship, and to use sample surveys to collect other types of data. In this case, the census will provide the total count by geographical subgroups and constitute a reliable frame for the sample surveys. In addition, if countries adopted common methodologies for data collection and processing, it would not only reduce the cost of the census but would also promote cooperation among countries.

3. *The availability of population census data*

In earlier census decades, problems in data collection, delay in processing and distribution accounted for underutilization of census data. With the developments in computer technologies, both hardware and software, over the last two decades, the time-span for census data processing has diminished. Tabulations are produced in record time, making data available to users within a few months of the completion of census fieldwork.

Total population

The population of 209 countries and areas was enumerated in the 1980 census decade, during which the percentage of population enumerated rose to 94 per cent from 80 per cent in the 1970 round. China is among the countries that conducted a modern census for the first time during the 1980 decade. Similarly, in the 1990 census decade, 200 countries and areas carried out a census, with 95 per cent coverage. It is hoped that the increase in the enumerated population will continue into the 2000 round of censuses if the problems of conducting successful censuses are overcome. When the United Nations *Demographic Yearbook, 1996* was prepared, 192 of the 200 countries and areas that were enumerated in the 1990 census decade had reported their total population (United Nations, 1998b).

Population composition by age and sex

Population censuses generally collect data by age and sex. Data collected and classified by sex raise no difficulties. However, data on age involve many problems. Age-heaping and age-misreporting are very noticeable in developing countries, especially where literacy is low and civil registration systems are incomplete or weak. Improvement in age-reporting requires efforts to improve the civil and vital registration systems.

Urbanization

The data on urbanization are obtained by classification of localities in each country. The definition of urban places varies from one country to another. Data are disseminated by size of locality as well as by place of usual residence. At present, it is difficult to adopt one concept or definition for all countries of the world because countries at different levels of economic development have adopted varied criteria to define an urban place.

Internal and international migration

Population censuses regularly contain questions related to place of usual residence, place of birth and place of previous usual residence. Moreover, some census questionnaires include duration of residence. This is sufficient to provide information on internal movements of the population. In addition, these questions provide data on international migration of the immigrant population. However, data on international migration may not be accurate, owing to the extent of undocumented immigration. In the 1990 round of censuses, although 174 countries provided data on international migration, as shown in table B, only 55 countries used a direct question on international migration.

TABLE B. MAJOR TOPICS COVERED BY POPULATION AND HOUSING CENSUSES IN THE 1980 AND 1990 CENSUS DECADES

Topic	*Census decade*	*World*	*Africa*	*North America*	*South America*	*Asia*	*Europe*	*Oceania*
Geographical	1980	203	50	32	13	42	41	25
	1990	183	44	30	13	34	39	23
Household and family	1980	203	50	32	13	42	41	25
	1990	178	44	30	13	36	32	23
Demographic and social	1980	205	51	33	13	43	39	26
	1990	186	44	30	13	37	39	23
Fertility and mortality	1980	152	35	25	10	35	28	19
	1990	157	41	30	12	30	28	16
Educational	1980	196	51	32	12	39	39	23
	1990	183	44	30	13	35	38	23
Economic	1980	201	50	32	12	42	41	24
	1990	187	44	30	13	37	39	24
International migration[a]	1990	174	42	30	13	32	34	23
Disability	1980	43	11	6	1	16	1	8
	1990	70	20	22	6	10	7	5
Total number of countries conducting census	1980	209	51	33	13	43	43	26
	1990	200	46	33	13	42	40	26

Source: United Nations Statistics Division.
[a]No information available for 1980 census decade.

Fertility and mortality

In earlier decades census planners used direct questions on fertility and mortality, such as births in the past 12 months, children ever born and deaths in the past 12 months, to obtain demographic parameters. Unfortunately, the parameters attained by these direct questions in developing countries were not accurate for several reasons, including memory failure, inability to date events far in the past and absence of registration records for reference (United Nations, 1983; 1992b). Several attempts to rephrase these questions have lead to some improvement in the data collected, but problems still remain.

As a result, several indirect methods were developed and applied to correct for imperfections in data and to produce plausible estimates of fertility and mortality parameters. Questions on children ever born and children surviving are early examples. In addition, data on maternal and paternal orphanhood, survival of the first spouse and deaths during the year prior to the census are used to estimate adulthood mortality. Although some of the questions are primarily designed for use in sample surveys, they are included in censuses, particularly in African countries, mainly because of budgetary constraints. While these techniques are quite powerful, they do not solve all problems that arise in demographic estimation, and they are not substitutes for direct calculation from good quality data.

Although census data on fertility and mortality cannot serve as a substitute for reliable and complete birth and death statistics from civil registration systems, they are particularly valuable for countries where registration is lacking or deficient and vital statistics are therefore unavailable. Even in countries with complete or satisfactory registration of vital events, the population census is useful as a supplement to satisfactory registration data because censuses provide data for the calculation of lifetime or cohort fertility of the female population. The goal should be to improve the data-collection process in order to reduce the dependency on indirect estimations.

4. *Census data dissemination*

Census activities are not complete until the data collected are made available to potential users in a form that meets their needs. Due to advances in electronic technology, data dissemination in conventionally published tables is supplemented by diskettes, CDs and on-line services. On-line dissemination has gained a new momentum due to the far-reaching spread of the use of Internet and the World Wide Web. Each medium of dissemination offers particular advantages and limitations, and the choice of using one or several of them depends on the context of use and on the intended users. In most instances, these methods complement each other and can provide effective ways to reach the public and private sectors. Printed publications are still the most widely circulated means of dissemination. Other means of dissemination depend mainly on the categories of users and the level of development in each country and area.

In conclusion, population censuses remain the most important source of demographic data, as they provide the detailed key information at all levels in the most cost-effective manner. No other source provides data at small geographical levels for planning and implementation of development programmes. To ensure the continuity of census-taking, the costs should be minimized by limiting the census content, adopting sampling procedures wherever applicable and adopting common methodologies within regions wherever possible. The challenge countries are facing is how to mobilize resources to conduct the forthcoming population census. Governments also have to look beyond the traditional sources of financing census activities by involving all sections of society (i.e., partnership with local communities, the private sector and other sectors of society).

B. SURVEYS

Sample surveys are widely recognized as an important tool for obtaining demographic and social data, particularly with respect to fertility and mortality. Unlike censuses, which are a complete national canvass of the population, sample surveys apply to selected entities of the population. The typical scope of a population survey is the size, distribution and characteristics of the studied population. Surveys are generally conducted periodically or on an ad hoc basis. Surveys, however, involve substantial costs and normally cannot provide data for small geographical regions and therefore cannot replace censuses. The success of a survey programme depends to a large extent on a well-designed and complete sampling frame, which only a census can provide.

Sample surveys, however, have some distinct advantages compared to censuses. The principal strength is the sharp focus that surveys provide in generating specific high-quality data on topics such as fertility, mortality, reproductive health and various socio-economic characteristics of the population. Because of the smaller scale, surveys provide an opportunity to study a topic in greater depth than does a census, and they tend to employ better qualified and trained enumerators than censuses do, with the result that the data generated is generally found to be more reliable than census data. Moreover, because surveys can be conducted at short intervals, they are more suitable for studying rapidly changing population characteristics. In response to rapid social and demographic changes, many developing countries are establishing an intercensal programme of household sample surveys.

Although known to provide "good" quality data, surveys have some technical drawbacks that could affect considerably the quality of the results, such as sampling and non-sampling errors. Sampling errors can be offset by the ability to compute sampling error for estimates of various size and thus to set the limits of the reliability of the estimates. Non-sampling errors, which cover all types of errors that are unrelated to the fact that the data are collected from a sample rather than from the entire population, further complicate the validity of the statistics. If survey data are based on a scientifically designed probability sample, it is possible to derive estimates of the sampling variance which, in some cases, may also take into account the impact of non-sampling errors. Another drawback to surveys is their limited generalizability. The size of the sample is usually such that reliable statistics can be shown only for broad geographic areas, and for relatively few categories.

Recognizing the importance of surveys in providing quality data at a reasonable cost and in a timely fashion, the United Nations and other international organizations have in the past three decades initiated efforts to strengthen national capabilities to plan and conduct population surveys. The most prominent of these efforts were the World Fertility Survey programme (WFS), the National Fertility Surveys (NFS), the Contraceptive Prevalence Surveys (CPS), the Demographic and Health Surveys (DHS), the National Housing Survey Capability Programme (NHSCP), and the Pan-Arab Project for Child Development (PAPCHILD).

The WFS, undertaken by the International Statistical Institute, with the collaboration of the United Nations, was the first international programme of surveys ever conducted. The WFS was established as a programme of research on human fertility throughout the world, and was conducted in 42 developing countries and 20 developed countries. Its primary objective was to meet the needs for reliable and up-to-date information on fertility, in order to orient official policies and programmes in population, health, and social and economic fields that have an impact on fertility. The WFS programme also played a lead role in the development of national capabilities in survey design, execution and interpretation. National fertility surveys and contraceptive prevalence surveys are some examples of such development.

Following the WFS initiatives, Demographic and Health Surveys (DHS) have become the most widely conducted surveys. Funded primarily by the United States Agency for International Development (USAID), DHS are now being implemented regularly in more than 60 developing countries. DHS collect data to estimate levels of fertility and infant and child mortality, duration of breastfeeding, contraceptive knowledge and related topics. One of the most significant contributions of the DHS programme is the creation of an internationally comparable body of data on the demographic and health characteristics of populations in developing countries.

The NHSCP was a more general survey programme sponsored by the United Nations in collaboration with the specialized agencies concerned and co-sponsored and/or supported by UNDP, UNFPA and UNICEF. It was designed to develop or strengthen the ability of developing countries to obtain demographic, social and socio-economic statistics through an integrated programme of household surveys. The NHSCP emphasized country-orientation and flexibility with respect to sequence and frequency of different surveys and with respect to the degree of detail of the data collection. While the NHSCP was multinational, no emphasis was placed on cross-country analysis and comparative research or on imposing standards and uniform procedures. It promoted standardization mainly through its approach to data collection via a series of one-topic surveys, whereby integration could be achieved by including a common set of core variables in all of the surveys (United Nations, 1981).

The Pan-Arab Project for Child Development (PAPCHILD) was one of the pioneering exercises of a regional child health project in which the United Nations played a key role. PAPCHILD was aimed primarily at helping Arab Governments in the formulation and implementation of the most effective, realistic and comprehensive maternal and childcare policies in the Arab region (League of Arab States, n.d.). Its objective was to improve the health and social status of mothers and children by enabling national institutions and organizations to have a steady flow of integrated, reliable and timely information for planning and monitoring of mother and childcare programmes and for formulating health policies and development programmes. The programme is being extended to include multilevel sources of data on family and health under a new programme, the Pan-Arab Project for Family and Health (PAPFAM).

C. ADMINISTRATIVE RECORDS

Administrative records are used for the production of statistics in various instances. In this section, the discussion is limited to vital statistics and international migration.

1. *Civil registration as a main source of vital statistics*

When a complete and reliable civil registration system exists in a country, it is the ideal source for data on levels and patterns of fertility, mortality and nuptiality, which are needed to monitor population growth and assess the health situation of the population, including maternal, child and infant deaths for the country as a whole, its regions, subregions and communities. The main advantages of civil registration are its continuity, permanency and country-wide scope.

Unfortunately, in many developing countries registration is either weak or almost entirely lacking outside urban areas. To provide assistance, the United Nations Statistics Division has advocated that the goal in each country or area should be to establish, operate and maintain accurate civil registration and vital statistics systems. Activities undertaken to improve the statistics from these systems by the Statistics Division include the review of concepts, definitions, and classifications pertaining to civil registration and vital statistics systems, the compilation of worldwide vital statistics, and the development of an international programme that supports and encourages the improvement of civil registration and vital statistics systems.

Development of standards for the collection of vital statistics

From the outset, the United Nations Statistics Division has developed methods for the collection, compilation and tabulation of population statistics by supporting the use of standard concepts, definitions and classifications for civil registration (United Nations, 1953) and by issuing the *Handbook of Vital Statistics Methods* to assist countries in implementing the principles and recommendations in *Principles for a Vital Statistics System: Recommendations for the Improvement and Standardization of Vital Statistics* (United Nations, 1953). The *Handbook of Vital Statistics Systems and Methods*, volumes I and II, were new contributions from the 1980s (United Nations, 1985a; 1991a). Along with its methodological activities, the Statistics Division has provided technical cooperation to the developing countries aimed at improving the quality of civil registration and vital statistics and fostering a better understanding among governmental officers of the roles of those systems in the emerging world statistical system.

The Statistics Division is now undertaking the review and revision of the *Principles and Recommendations for a Vital Statistics System* to incorporate the latest developments in concepts, definitions, classifications and coding systems, as well as new technology for storage, retrieval and data processing of vital records and statistics. Once reviewed by a group of experts and submitted to the Statistical Commission for adoption, the *Principles and Recommendations* will be published in all official languages of the United Nations for worldwide dissemination.

The compilation of vital statistics on a worldwide basis

The United Nations Statistics Division has also laid the groundwork for the collection, compilation and dissemination of official national vital statistics in the *Demographic Yearbook*. Table C gives a summary of the availability of live birth and death statistics at the international level and their degree of completeness. In this instance, completeness is measured by comparing nationally derived rates with those estimated in *World Population Prospects* for a comparable time period.

The completeness of birth registration exceeds 90 per cent in 138 countries or areas out of 234. Birth registration is considered complete in developed countries and also in developing countries such as Argentina, Brazil, Chile, China, Costa Rica, Egypt, the Libyan Arab Jamahiriya, Liberia, Sri Lanka, Mauritius, Mexico, Panama, Seychelles, Singapore, Tunisia, Uruguay and Venezuela. These countries publish vital statistics on a timely basis and are working to enhance accuracy of data collected in registration forms and vital statistical reports. In 46 additional developing countries or areas, birth registration is less than 90 per cent complete. Of the countries registering live births, 16 are in Africa, three in North America, four in South America, 14 in Asia and six in Oceania. There are 50 countries still unable to present birth statistics, while 55 are not reporting death statistics. Those countries are either in need of undertaking improvement programmes for civil registration and vital statistics systems to minimize their long dependency on demographic estimates, or need to establish such systems.

Death registration is somewhat less complete. There are 134 countries or areas that have attained complete death registration. In 25 countries registration coverage is less than 90 per cent. Where registration is close to 90 per cent complete, with persistent effort countries could, in a few years, rely on death registration data. Where fewer than 70 per cent of deaths occurring in a year are captured by the system, a considerable investment would be required to provide reliable data from death registration; 25 countries are classified as still having no information available from registration of deaths. Of those countries, 28 are in Africa, three in North America, 19 in Asia, and only one in Europe.

International comparability relies on completeness of registration and international standards for definitions, tabulations and classifications. For example, 32 countries or areas still report vital statistics of limited comparability because they are tabulated by year of registration rather than occurrence. This fact may particularly distort comparability if late registration accounts for a large proportion in any given year. Differences in definitions of a live birth may also hamper comparability for birth and infant death rates. For instance, when live births are defined to exclude infants who die before registration, deaths during infancy are underestimated. This was a common practice in the former Soviet Union.

The international programme to accelerate the improvement of civil registration and vital statistics

A programme developed to assist countries trying to improve the timeliness and completeness of their vital statistics, financed in part by UNFPA, was completed in 1997. Because the vital statistics generated from civil registration are still unsatisfactory in about 96 countries or areas that report their vital statistics to the United Nations, the programme emphasized national commitment to developing and maintaining reliable civil registration and vital statistics systems. Five workshops on Strategies for Accelerating the Improvement of Civil Registration and Vital Statistics Systems were conducted at the regional and subregional levels. In addition, a series of *Handbooks on Civil Registration and Vital Statistics Systems* was prepared to provide countries with detailed information on (*a*) organizing, operating and maintaining these systems; (*b*) developing a legal structure; (*c*) providing for computerizing the operations of registration and preparation of vital statistics; (*d*) developing a plan for communication; and (*e*) using and archiving individual records from these systems (United Nations, 1998c-g). Further work is planned in this area to continue these activities by disseminating the information contained in the five handbooks and developing a training manual based on that information and on the new *Principles and Recommendations*.

2. *International migration statistics*

International migration influences the size and growth of population in sending and receiving countries and, when there is significant age-sex selectivity, may also affect the age-sex structure of the population. Unfortunately, the quality of data produced from administrative record systems may be unreliable and the absence of commonly accepted definitions limits the comparability of statistics on this subject. In addition, data are frequently unavailable, as shown in the *Demographic Yearbook* when international migration statistics on both flows and stocks were included as the special topic (United Nations, 1978; 1991b).

In order to remedy some of these problems, the United Nations over the past several decades has sought to strengthen the system of international migration statistics by adopting common concepts and definitions used in distinguishing immigrants and emigrants from other international travellers. Recent efforts in this regard include the preparation of the *Recommendations on Statistics of International Migration: Revision 1* (United Nations, 1998h), prepared by the Statistics Division in collaboration with the Population Division and adopted by the Statistical Commission at its twenty-ninth session in 1997 and published in 1998.

TABLE C. NUMBER OF COUNTRIES BY COMPLETENESS OF BIRTH AND DEATH REGISTRATION

Completeness of registration (percentage)	*World*		*Africa*		*North America*		*South America*		*Asia*		*Europe*		*Oceania*	
	B	*D*	*B*	*D*	*B*	*D*	*B*	*D*	*B*	*D*	*B*	*D*	*B*	*D*
Total	234	234	58	58	37	37	14	14	50	50	50	50	25	25
90 or more	138	134	16	16	30	27	10	10	21	18	45	48	16	15
Less than 90	46	45	16	14	3	7	4	4	14	13	3	1	6	6
Information not available	50	55	26	28	4	3	—	—	15	19	2	1	3	—

Source: United Nations Statistics Division.

NOTE: B—Completeness of registration of live births.
D—Completeness of registration of deaths.

D. CONCLUSIONS

Over the years, national statistical systems have improved considerably but there is still much to be done to institutionalize the gains. Data-collection processing and dissemination technologies are changing rapidly. Statistically less developed countries are lagging behind in keeping pace with these rapid changes. In addition, data-collection costs are rising rapidly and countries are finding it difficult to collect and disseminate data on a regular basis.

During the 1990 round of population censuses, the coverage was near-universal. There are some concerns that this coverage will be difficult to maintain for the 2000 census decade. The vital registration systems in many countries are still very weak and the situation is unlikely to improve in the near future. Ad hoc population surveys have filled the gap for measuring fertility and mortality but the frequency is irregular. International migration statistics are collected at entry and departure points but many countries do not regularly publish them.

The demand for data is increasing rapidly. More and more users want information at the smallest geographical level and the need for such census information is constantly increasing since the census is the only cost-effective way to provide small-area information.

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ANNEX TABLES

TABLE A.1. POPULATION SIZE, 1998, AND COMPONENTS OF GROWTH, 1995-2000, MAJOR AREAS AND REGIONS
(*Thousands*)

Major area and region	*Population (1998)*	*Births*	*Deaths*	*Natural increase*	*Net migration*	*Total annual growth*
				(annual averages)		
World total	5 901 054	129 810	52 072	77 738	0	77 738
More developed regions[a]	1 182 184	13 224	11 951	1 273	1 971	3 243
Less developed regions[b]	4 718 869	116 586	40 121	76 465	-1 971	74 494
Least developed countries	614 919	23 442	8 838	14 604	-186	14 418
Africa	748 927	28 115	10 331	17 783	-287	17 496
Eastern Africa	234 809	9 830	4 071	5 759	205	5 964
Middle Africa	90 816	4 005	1 376	2 630	-247	2 382
Northern Africa	166 676	4 568	1 206	3 362	-125	3 237
Southern Africa	45 601	1 274	555	719	0	720
Western Africa	211 024	8 437	3 124	5 313	-120	5 193
Asia	3 585 372	77 953	27 492	50 461	-1 207	49 254
Eastern Asia	1 461 134	22 801	10 149	12 652	-65	12 587
South-central Asia	1 440 711	38 576	12 534	26 042	-924	25 118
South-eastern Asia	503 578	11 551	3 639	7 912	-297	7 615
Western Asia	179 949	5 024	1 170	3 854	79	3 933
Europe	728 871	7 493	8 248	-755	950	195
Eastern Europe	308 291	3 034	4 000	-966	356	-610
Northern Europe	94 142	1 101	1 021	80	60	140
Southern Europe	143 876	1 428	1 411	18	147	165
Western Europe	182 562	1 929	1 817	112	388	500
Latin America and the Caribbean	503 524	11 554	3 245	8 308	-471	7 838
Caribbean	37 351	776	289	488	-87	401
Central America	130 457	3 427	686	2 740	-349	2 391
South America	335 715	7 351	2 270	5 081	-34	5 046
Northern America	304 716	4 172	2 528	1 644	930	2 574
Oceania	29 644	527	227	300	81	381
Australia/New Zealand	22 316	305	169	136	90	226
Melanesia	6 201	188	52	136	-4	132
Micronesia	516	18	3	15	-2	13
Polynesia	611	15	3	12	-3	9

Source: World Population Prospects: The 1998 Revision, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).
[a]Comprising all regions of Europe and Northern America, Australia/New Zealand and Japan.
[b]Comprising all regions of Africa, Asia (excluding Japan), Latin America and the Caribbean, and Melanesia, Micronesia and Polynesia.

TABLE A.2. RATES OF POPULATION GROWTH, FERTILITY, MORTALITY AND NET MIGRATION, MAJOR AREAS AND REGIONS, 1995-2000

Major area or region	Crude birth rate	Crude death rate	Net migration rate	Rate of natural increase	Population growth rate	Total fertility rate (children per woman)	Life expectancy at birth: Male	Female	Both sexes
	(per 1,000 population)			(percentage)					
World total	22.1	8.9	0.0	1.3	1.3	2.7	63.2	67.6	65.4
More developed regions[a]	11.2	10.1	1.7	0.1	0.3	1.6	71.1	78.7	74.9
Less developed regions[b]	24.9	8.6	-0.4	1.6	1.6	3.0	61.8	65.0	63.3
Least developed countries	38.5	14.5	-0.3	2.4	2.4	5.1	49.6	51.5	50.5
Africa	38.0	13.9	-0.4	2.4	2.4	5.1	50.0	52.8	51.4
Eastern Africa	42.4	17.5	0.9	2.5	2.6	5.8	44.4	46.4	45.4
Middle Africa	44.7	15.3	-2.8	2.9	2.7	6.2	48.6	51.7	50.1
Northern Africa	27.7	7.3	-0.8	2.0	2.0	3.6	63.3	66.4	64.8
Southern Africa	28.3	12.3	0.0	1.6	1.6	3.4	51.5	57.5	54.4
Western Africa	40.4	15.0	-0.6	2.5	2.5	5.5	48.6	51.3	49.9
Asia	21.9	7.7	-0.3	1.4	1.4	2.6	64.8	67.9	66.3
Eastern Asia	15.7	7.0	0.0	0.9	0.9	1.8	68.8	73.4	71.0
South-central Asia	27.0	8.8	-0.6	1.8	1.8	3.4	61.8	62.9	62.3
South-eastern Asia	23.1	7.3	-0.6	1.6	1.5	2.7	63.7	67.8	65.7
Western Asia	28.2	6.6	0.4	2.2	2.2	3.8	65.9	70.2	68.0
Europe	10.3	11.3	1.3	-0.1	0.0	1.4	69.2	77.4	73.3
Eastern Europe	9.8	13.0	1.2	-0.3	-0.2	1.4	63.3	73.8	68.5
Northern Europe	11.7	10.9	0.6	0.1	0.1	1.7	73.5	79.5	76.5
Southern Europe	9.9	9.8	1.0	0.0	0.1	1.3	73.7	80.1	76.9
Western Europe	10.6	10.0	2.1	0.1	0.3	1.5	74.1	80.8	77.6
Latin America and the Caribbean	23.1	6.5	-0.9	1.7	1.6	2.7	66.1	72.6	69.2
Caribbean	20.9	7.8	-2.3	1.3	1.1	2.5	66.3	71.0	68.6
Central America	26.5	5.3	-2.7	2.1	1.9	3.0	68.4	74.0	71.2
South America	22.1	6.8	-0.1	1.5	1.5	2.6	65.3	72.3	68.7
Northern America	13.8	8.3	3.1	0.5	0.8	1.9	73.6	80.2	76.9
Oceania	17.9	7.7	2.8	1.0	1.3	2.4	71.4	76.3	73.8
Australia/New Zealand	13.8	7.6	4.1	0.6	1.0	1.8	75.2	80.9	78.0
Melanesia	30.7	8.5	-0.6	2.2	2.2	4.3	59.9	62.2	61.0
Micronesia	35.5	5.2	-4.5	3.0	2.6	4.1	67.6	71.4	69.4
Polynesia	25.1	4.8	-4.7	2.0	1.6	3.4	69.3	74.1	71.6

Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).
[a]Comprising all regions of Europe and Northern America, Australia/New Zealand and Japan.
[b]Comprising all regions of Africa, Asia (excluding Japan), Latin America and the Caribbean, and Melanesia, Micronesia and Polynesia.

TABLE A.3. BIRTHS BY AGE OF MOTHER AND DEATHS BY AGE, MAJOR AREAS AND REGIONS, 1995-2000

Major area and region	Births (thousands)	Births by age group of mother: Under 20 (percentage)	20-34 (percentage)	35+ (percentage)	Deaths (thousands)	Deaths by age group: 0-4 (percentage)	5-14 (percentage)	15-64 (percentage)	65+ (percentage)
World total	649 050	13.1	77.3	9.6	260 361	20.2	3.7	31.9	44.1
More developed regions[a]	66 120	9.2	80.2	10.5	59 757	1.3	0.3	25.5	72.8
Less developed regions[b]	582 930	13.5	76.9	9.5	200 604	25.8	4.7	33.8	35.6
Least developed countries	117 209	18.0	68.5	13.5	44 190	41.5	7.9	34.8	15.8
Africa	140 574	16.7	69.6	13.6	51 657	38.6	8.4	36.5	16.4
Eastern Africa	49 150	16.8	69.8	13.4	20 356	39.6	8.7	39.4	12.3
Middle Africa	20 027	22.9	64.6	12.5	6 878	44.0	9.1	32.3	14.5
Northern Africa	22 840	9.6	74.2	16.2	6 030	26.8	4.7	32.5	36.0
Southern Africa	6 370	13.1	73.9	13.0	2 773	21.2	3.4	52.9	22.5
Western Africa	42 186	18.2	68.7	13.1	15 619	42.6	10.1	33.3	14.0
Asia	389 763	11.8	80.5	7.8	137 459	21.3	3.5	31.9	43.4
Eastern Asia	114 007	1.2	95.3	3.5	50 744	10.0	1.1	30.0	58.9
South-central Asia	192 882	18.6	73.5	7.8	62 672	30.2	5.4	31.6	32.7
South-eastern Asia	57 753	10.4	77.1	12.5	18 193	19.9	3.5	38.1	38.5
Western Asia	25 121	10.1	73.9	16.0	5 849	27.8	2.8	30.5	38.9
Europe	37 466	8.4	81.4	10.2	41 242	1.4	0.4	26.8	71.4
Eastern Europe	15 170	14.7	78.9	6.4	19 999	1.7	0.5	34.9	62.8
Northern Europe	5 507	6.3	80.8	12.9	5 104	1.0	0.2	18.5	80.3
Southern Europe	7 142	4.6	83.1	12.4	7 053	1.3	0.3	19.1	79.4
Western Europe	9 647	2.6	84.5	12.9	9 086	0.8	0.2	19.8	79.2
Latin America and the Caribbean	57 768	16.5	72.7	10.9	16 225	15.9	2.3	37.9	43.9
Caribbean	3 882	15.7	72.2	12.1	1 443	14.5	3.2	34.7	47.6
Central America	17 133	16.4	73.0	10.7	3 432	20.9	2.7	36.6	39.9
South America	36 753	16.6	72.6	10.9	11 349	14.6	2.1	38.8	44.6
Northern America	20 859	13.5	74.7	11.8	12 641	1.4	0.3	23.6	74.6
Oceania	2 635	5.9	78.3	15.8	1 135	7.3	1.1	25.7	65.9
Australia/New Zealand	1 527	5.6	80.9	13.5	846	1.3	0.3	19.7	78.7
Melanesia	941	5.8	74.1	20.1	261	25.4	3.5	44.3	26.9
Micronesia	91	9.3	78.7	11.9	13	26.1	3.4	36.7	33.8
Polynesia	76	10.3	75.9	13.7	15	10.9	1.6	38.4	49.1

Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).
[a]Comprising all regions of Europe and Northern America, Australia/New Zealand and Japan.
[b]Comprising all regions of Africa, Asia (excluding Japan), Latin America and the Caribbean, and Melanesia, Micronesia and Polynesia.

TABLE A.4. INFANT AND CHILD MORTALITY ESTIMATES, MAJOR AREAS AND REGIONS, 1995-2000

Major area and region	Infant mortality rate (per 1,000 births)	Deaths under one year (thousands)	Probability of dying by age 5 (per 1,000 births)			Deaths between ages 0 and 5 (thousands)		
			Total	Male	Female	Total	Male	Female
World total	57	37 175	80	80	80	52 610	27 019	25 591
More developed regions[a]	9	619	11	13	10	786	454	332
Less developed regions[b]	63	36 556	87	87	88	51 824	26 565	25 259
Least developed countries	99	11 628	156	160	151	18 344	9 637	8 706
Africa	87	12 227	140	146	133	19 946	10 622	9 324
Eastern Africa	101	4 963	161	169	154	8 059	4 273	3 786
Middle Africa	95	1 902	149	158	139	3 027	1 630	1 397
Northern Africa	52	1 185	70	73	67	1 617	864	752
Southern Africa	62	392	92	102	82	587	332	256
Western Africa	90	3 785	155	162	149	6 656	3 524	3 132
Asia	57	22 243	74	71	77	29 261	14 468	14 793
Eastern Asia	38	4 281	44	39	50	5 066	2 388	2 677
South-central Asia	73	14 026	96	91	101	18 947	9 209	9 738
South-eastern Asia	46	2 665	62	66	57	3 621	1 985	1 636
Western Asia	51	1 271	65	69	61	1 627	886	741
Europe	12	436	14	16	12	558	325	233
Eastern Europe	18	268	22	25	18	346	206	140
Northern Europe	8	41	9	10	8	50	29	22
Southern Europe	10	70	12	13	11	91	51	40
Western Europe	6	56	7	8	6	71	40	31
Latin America and the Caribbean	36	2 056	44	49	39	2 580	1 459	1 122
Caribbean	36	141	53	57	48	209	116	93
Central America	33	564	41	45	38	716	397	319
South America	37	1 351	44	50	39	1 655	945	710
Northern America	7	147	8	9	7	180	101	78
Oceania	24	62	32	31	32	83	42	40
Australia/New Zealand	6	9	7	8	6	11	6	5
Melanesia	53	50	71	68	73	66	33	33
Micronesia	34	3	44	47	40	3	2	2
Polynesia	17	1	20	20	21	2	1	1

Source: World Population Prospects: The 1998 Revision, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).
[a]Comprising all regions of Europe and Northern America, Australia/New Zealand and Japan.
[b]Comprising all regions of Africa, Asia (excluding Japan), Latin America and the Caribbean, and Melanesia, Micronesia and Polynesia.

TABLE A.5 AGE COMPOSITION OF THE POPULATION, MAJOR AREAS AND REGIONS, 1998

Major area and region	Population by age group (thousands) 0-14	15-64	65+	Population by age group (percentage) 0-14	15-64	65+	Sex ratio by age group (males per 100 females) 0-14	15-64	65+	Dependency ratios Total	Young age	Elderly
World total	1 793 067	3 708 711	399 275	30.4	62.8	6.8	105.6	102.7	75.6	59.1	48.3	10.8
More developed regions[a]	222 160	793 902	166 122	18.8	67.2	14.1	105.0	99.5	64.7	48.9	28.0	20.9
Less developed regions[b]	1 570 907	2 914 810	233 153	33.3	61.8	4.9	105.6	103.6	84.2	61.9	53.9	8.0
Least developed countries	262 014	334 015	18 889	42.6	54.3	3.1	102.3	99.7	85.1	84.1	78.4	5.7
Africa	321 648	403 569	23 710	42.9	53.9	3.2	101.5	98.9	80.8	85.6	79.7	5.9
Eastern Africa	107 411	120 882	6 516	45.7	51.5	2.8	100.9	98.5	80.5	94.2	88.9	5.4
Middle Africa	42 409	45 591	2 816	46.7	50.2	3.1	100.6	96.6	77.3	99.2	93.0	6.2
Northern Africa	61 224	98 913	6 539	36.7	59.3	3.9	104.2	101.9	85.9	68.5	61.9	6.6
Southern Africa	16 561	27 448	1 592	36.3	60.2	3.5	100.2	96.9	62.3	66.1	60.3	5.8
Western Africa	94 043	110 735	6 246	44.6	52.5	3.0	101.0	97.9	83.0	90.6	84.9	5.6
Asia	1 102 436	2 279 904	203 031	30.7	63.6	5.7	107.2	105.3	84.0	57.3	48.4	8.9
Eastern Asia	359 963	993 737	107 434	24.6	68.0	7.4	110.5	105.9	81.2	47.0	36.2	10.8
South-central Asia	514 746	861 616	64 349	35.7	59.8	4.5	106.3	106.8	90.9	67.2	59.7	7.5
South-eastern Asia	163 581	317 073	22 924	32.5	63.0	4.6	104.1	98.9	79.3	58.8	51.6	7.2
Western Asia	64 146	107 479	8 324	35.6	59.7	4.6	104.2	107.4	81.8	67.4	59.7	7.7
Europe	132 465	491 461	104 945	18.2	67.4	14.4	105.0	98.7	60.9	48.3	27.0	21.4
Eastern Europe	59 637	209 598	39 055	19.3	68.0	12.7	104.3	95.2	51.5	47.1	28.5	18.6
Northern Europe	18 001	61 492	14 649	19.1	65.3	15.6	105.3	100.8	69.3	53.1	29.3	23.8
Southern Europe	23 162	97 768	22 946	16.1	68.0	15.9	106.2	99.9	70.5	47.2	23.7	23.5
Western Europe	31 664	122 603	28 295	17.3	67.2	15.5	105.2	102.6	63.3	48.9	25.8	23.1
Latin America and the Caribbean	163 134	313 882	26 509	32.4	62.3	5.3	103.7	97.4	78.9	60.4	52.0	8.4
Caribbean	11 288	23 545	2 518	30.2	63.0	6.7	103.7	98.3	86.2	58.6	47.9	10.7
Central America	46 569	78 173	5 715	35.7	59.9	4.4	104.0	96.9	82.9	66.9	59.6	7.3
South America	105 277	212 163	18 275	31.4	63.2	5.4	103.5	97.5	76.7	58.2	49.6	8.6
Northern America	65 829	200 718	38 169	21.6	65.9	12.5	104.8	100.7	71.2	51.8	32.8	19.0
Oceania	7 565	19 153	2 926	25.5	64.6	9.9	105.4	102.0	78.5	54.8	39.5	15.3
Australia/New Zealand	4 769	14 865	2 682	21.4	66.6	12.0	105.4	100.5	77.5	50.1	32.1	18.0
Melanesia	2 376	3 625	200	38.3	58.5	3.2	105.5	106.8	90.7	71.1	65.5	5.5
Micronesia	201	298	17	38.9	57.8	3.4	105.0	109.7	92.6	73.1	67.3	5.8
Polynesia	220	366	25	36.0	59.9	4.2	105.9	109.5	88.7	67.1	60.1	7.0

Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).

[a]Comprising all regions of Europe and Northern America, Australia/New Zealand and Japan.

[b]Comprising all regions of Africa, Asia (excluding Japan), Latin America and the Caribbean, and Melanesia, Micronesia and Polynesia.

TABLE A.6. COUNTRIES OR AREAS WITH THE LARGEST AND THE SMALLEST POPULATION SIZE, 1998

Rank	Country or area	Population (thousands)
	A. *The 10 countries or areas with the largest population*	
1	China[a]	1 255 698
2	India	982 223
3	United States of America	274 028
4	Indonesia	206 338
5	Brazil	165 851
6	Pakistan	148 166
7	Russian Federation	147 434
8	Japan	126 281
9	Bangladesh	124 774
10	Nigeria	106 409
	B. *The 11 countries or areas with the smallest population*	
1	Pitcairn	—
2	Holy See	—
3	Tokelau	1
4	Niue	2
5	Falkland Islands (Malvinas)	2
6	Saint Helena	6
7	Saint Pierre and Miquelon	7
8	Anguilla	8
9	Montserrat	11
10	Nauru	11
11	Tuvalu	11
	C. *The 10 States Members of the United Nations with the smallest population*	
1	Palau	19
2	San Marino	26
3	Liechtenstein	32
4	Monaco	33
5	Saint Kitts and Nevis	39
6	Marshall Islands	60
7	Antigua and Barbuda	67
8	Dominica	71
9	Andorra	72
10	Seychelles	76

Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).

NOTE: A dash (—) indicates that the population is less than 500 persons.

[a]For statistical purposes, the data for China do not include Hong Kong Special Administrative Region (Hong Kong SAR).

TABLE A.7. COUNTRIES OR AREAS WITH THE HIGHEST AND THE LOWEST FERTILITY, 1995-2000

Rank	Country or area	Percentage urban
	A. *The 10 countries or areas with the highest fertility*	
1	Yemen	7.60
2	Gaza Strip	7.30
3	Somalia	7.25
4	Uganda	7.10
5	Afghanistan	6.90
6	Niger	6.84
7	Angola	6.80
8	Malawi	6.75
9	Mali	6.60
10	Burkina Faso	6.57
	B. *The 10 countries or areas with the lowest fertility*	
1	Spain	1.15
2	Romania	1.17
3	Czech Republic	1.19
4	Italy	1.20
5	Bulgaria	1.23
6	Latvia	1.25
7	Slovenia	1.26
8	Greece	1.28
9	Estonia	1.29
10	Germany	1.30

Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).

TABLE A.8. COUNTRIES OR AREAS WITH THE HIGHEST AND THE LOWEST LIFE EXPECTANCY, 1995-2000

Rank	Country or area	Male (years)	Country or area	Female (years)	Country or area	Both sexes combined (years)
	A. The 10 countries or areas with the highest life expectancy					
1	Japan	76.8	Japan	82.9	Japan	80.0
2	Iceland	76.8	France	82.0	Iceland	79.0
3	Sweden	76.3	Martinique	82.0	Canada	79.0
4	Canada	76.1	Canada	81.8	Martinique	78.8
5	China, Hong Kong SAR[a]	75.8	Switzerland	81.8	Switzerland	78.6
6	Israel	75.7	Spain	81.5	Sweden	78.5
7	Greece	75.6	China, Hong Kong SAR[a]	81.4	China, Hong Kong SAR[a]	78.5
8	Cyprus	75.5	Iceland	81.3	Australia	78.2
9	Martinique	75.5	Italy	81.2	Italy	78.2
10	Australia	75.5	Australia	81.1	Norway	78.1
	B. The 10 countries or areas with the lowest life expectancy					
1	Sierra Leone	35.8	Sierra Leone	38.7	Sierra Leone	37.2
2	Uganda	38.9	Malawi	39.6	Malawi	39.3
3	Malawi	38.9	Uganda	40.4	Uganda	39.6
4	Rwanda	39.4	Zambia	40.6	Zambia	40.1
5	Zambia	39.5	Rwanda	41.7	Rwanda	40.5
6	Burundi	41.0	Burundi	43.8	Burundi	42.4
7	Ethiopia	42.4	Ethiopia	44.3	Ethiopia	43.3
8	Central African Republic	42.9	Zimbabwe	44.7	Zimbabwe	44.1
9	Guinea-Bissau	43.5	Burkina Faso	45.2	Burkina Faso	44.4
10	Burkina Faso	43.6	Afghanistan	46.0	Central African Republic	44.9

Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).
[a] As of 1 July 1997, Hong Kong became a Special Administrative Region (SAR) of China.

TABLE A.9. COUNTRIES OR AREAS WITH THE HIGHEST AND THE LOWEST INFANT MORTALITY RATE, 1995-2000

Rank	*Country or area*	*Infant mortality rate (per 1,000 live births)*
	A. *The 10 countries or areas with the highest infant mortality*	
1	Sierra Leone	170
2	Afghanistan	151
3	Malawi	138
4	East Timor	135
5	Guinea-Bissau	130
6	Angola	125
7	Guinea	124
8	Rwanda	124
9	Somalia	122
10	Gambia	122
	B. *The 10 countries or areas with the lowest infant mortality*	
1	Japan	4
2	Singapore	5
3	Norway	5
4	Germany	5
5	Iceland	5
6	Sweden	5
7	Finland	6
8	Australia	6
9	Switzerland	6
10	China, Hong Kong SAR[a]	6

Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).

[a]As of 1 July 1997, Hong Kong became a Special Administrative Region (SAR) of China.

TABLE A.10. TRENDS IN POPULATION SIZE AND GROWTH FOR MAJOR AREAS, REGIONS AND COUNTRIES, 1975-2015, AND GOVERNMENTS' VIEWS AND POLICIES ON POPULATION GROWTH AND IMMIGRATION

Major area, region and country	Mid-year population (thousands)			Average annual growth rate (percentage)		Governments' views and policies	
	1975	1998	2015	1975-1998	1998-2015	View on population growth and type of intervention to modify growth	View and policy on immigration
World	4 074 710	5 901 054	7 154 366	1.61	1.13		
More developed regions[a]	1 048 380	1 182 184	1 214 394	0.52	0.16		
Less developed regions[b]	3 026 330	4 718 869	5 939 972	1.93	1.35		
Least developed countries	348 425	614 919	901 979	2.47	2.25		
Africa	405 880	748 927	1 077 795	2.66	2.14		
Eastern Africa	123 836	234 809	346 929	2.78	2.30		
Burundi	3 680	6 457	9 492	2.44	2.27	Too high: intervene to lower	Satisfactory: no intervention
Comoros	319	658	998	3.15	2.45	Too high: intervene to lower	Satisfactory: no intervention
Djibouti	205	623	866	4.83	1.94	Satisfactory: no intervention	Too high: intervene to lower
Eritrea	2 089	3 577	5 498	2.34	2.53		
Ethiopia	32 221	59 649	90 947	2.68	2.48	Too high: no intervention	Satisfactory: no intervention
Kenya	13 741	29 008	37 611	3.25	1.53	Too high: intervene to lower	Satisfactory: no intervention
Madagascar	7 819	15 057	23 359	2.85	2.58	Too high: intervene to lower	Satisfactory: no intervention
Malawi	5 244	10 346	15 770	2.95	2.48	Too high: no intervention	Too high: no intervention
Mauritius	892	1 141	1 302	1.07	0.78	Satisfactory: intervene to maintain	Satisfactory: intervene to lower
Mozambique	10 498	18 880	25 212	2.55	1.70	Too high: no intervention	Satisfactory: no intervention
Réunion	483	682	814	1.50	1.04		
Rwanda	4 384	6 604	10 537	1.78	2.75	Too high: intervene to lower	Satisfactory: no intervention
Seychelles	59	76	90	1.07	0.99	Too high: intervene to lower	Satisfactory: intervene to maintain
Somalia	4 134	9 237	16 350	3.50	3.36	Satisfactory: no intervention	Satisfactory: no intervention
Uganda	11 183	20 554	34 475	2.65	3.04	Too high: intervene to lower	Satisfactory: no intervention
United Republic of Tanzania	15 900	32 102	47 221	3.05	2.27	Too high: intervene to lower	Satisfactory: no intervention
Zambia	4 841	8 781	12 817	2.59	2.22	Too high: intervene to lower	Too high: intervene to lower
Zimbabwe	6 143	11 377	13 572	2.68	1.04	Too high: intervene to lower	Satisfactory: intervene to lower
Middle Africa	45 334	90 816	144 322	3.02	2.72		
Angola	6 123	12 092	19 702	2.96	2.87	Satisfactory: no intervention	Satisfactory: no intervention
Cameroon	7 527	14 305	21 503	2.79	2.40	Too high: intervene to lower	Satisfactory: intervene to lower
Central African Republic	2 057	3 485	4 764	2.29	1.84	Too high: no intervention	Satisfactory: no intervention
Chad	4 030	7 270	11 185	2.57	2.53	Satisfactory: no intervention	Satisfactory: intervene to maintain
Congo	1 447	2 785	4 415	2.85	2.71	Too high: intervene to lower	Satisfactory: intervene to maintain
Dem. Republic of the Congo	23 251	49 139	80 261	3.25	2.89	Satisfactory: no intervention	Satisfactory: no intervention
Equatorial Guinea	225	431	645	2.82	2.38	Satisfactory: intervene to maintain	Satisfactory: no intervention
Gabon	593	1 167	1 656	2.94	2.06	Too low: intervene to raise	Too high: intervene to lower
Sao Tome and Principe	81	141	190	2.42	1.76	Satisfactory: no intervention	Satisfactory: no intervention

TABLE A.10 (*continued*)

Major area, region and country	Mid-year population (thousands) 1975	1998	2015	Average annual growth rate (percentage) 1975-1998	1998-2015	Governments' views and policies: View on population growth and type of intervention to modify growth	View and policy on immigration
Northern Africa	96 364	166 676	220 615	2.38	1.65		
Algeria	16 018	30 081	41 199	2.74	1.85	Too high: intervene to lower	Satisfactory: no intervention
Egypt	38 841	65 978	85 224	2.30	1.51	Too high: intervene to lower	Satisfactory: intervene to lower
Libyan Arab Jamahiriya	2 446	5 339	7 573	3.39	2.06	Satisfactory: no intervention	Too high: intervene to lower
Morocco	17 305	27 377	34 784	1.99	1.41	Too high: intervene to lower	Satisfactory: no intervention
Sudan	16 012	28 292	39 811	2.48	2.01	Too high: intervene to lower	Satisfactory: intervene to raise
Tunisia	5 668	9 335	11 607	2.17	1.28	Satisfactory: intervene to lower	Satisfactory: no intervention
Western Sahara	75	275	417	5.67	2.45		
Southern Africa	28 056	45 601	51 748	2.11	0.74		
Botswana	759	1 570	1 967	3.16	1.33	Too high: intervene to lower	Satisfactory: no intervention
Lesotho	1 187	2 062	2 893	2.40	1.99	Too high: intervene to lower	Satisfactory: no intervention
Namibia	900	1 660	2 031	2.66	1.19	Too high: intervene to lower	Satisfactory: intervene to raise
South Africa	24 728	39 357	43 387	2.02	0.57	Too high: intervene to lower	Satisfactory: intervene to maintain
Swaziland	482	952	1 470	2.96	2.56	Too high: intervene to lower	Satisfactory: no intervention
Western Africa	112 289	211 024	314 181	2.74	2.34		
Benin	3 046	5 781	8 940	2.79	2.56	Satisfactory: no intervention	Satisfactory: no intervention
Burkina Faso	6 108	11 305	18 096	2.68	2.77	Too high: no intervention	Satisfactory: no intervention
Cape Verde	278	408	579	1.67	2.05	Too high: intervene to lower	Satisfactory: no intervention
Côte d'Ivoire	6 755	14 292	20 047	3.26	1.99	Satisfactory: intervene to raise	Too high: intervene to lower
Gambia	548	1 229	1 821	3.51	2.31	Too high: intervene to lower	Too high: intervene to lower
Ghana	9 829	19 162	29 820	2.90	2.60	Too high: intervene to lower	Satisfactory: no intervention
Guinea	4 149	7 337	10 488	2.48	2.10	Too high: intervene to lower	Satisfactory: no intervention
Guinea-Bissau	627	1 161	1 622	2.68	1.97	Satisfactory: no intervention	Satisfactory: no intervention
Liberia	1 609	2 666	5 131	2.19	3.85	Too high: intervene to lower	Satisfactory: intervene to maintain
Mali	6 169	10 694	16 657	2.39	2.61	Too high: intervene to lower	Satisfactory: intervene to maintain
Mauritania	1 371	2 529	3 885	2.66	2.53	Satisfactory: no intervention	Satisfactory: no intervention
Niger	4 771	10 078	16 690	3.25	2.97	Too high: no intervention	Satisfactory: no intervention
Nigeria	57 004	106 409	153 307	2.71	2.15	Too high: intervene to lower	Satisfactory: intervene to maintain
Saint Helena	5	6	7	0.84	0.84		
Senegal	4 806	9 003	13 665	2.73	2.45	Too high: intervene to lower	Satisfactory: no intervention
Sierra Leone	2 931	4 568	6 677	1.93	2.23	Too high: no intervention	Satisfactory: no intervention
Togo	2 285	4 397	6 749	2.85	2.52	Too high: no intervention	Satisfactory: no intervention
Asia	2 405 633	3 585 372	4 346 894	1.73	1.13		
Eastern Asia	1 097 012	1 461 134	1 633 717	1.25	0.66		
China[c]	927 808	1 255 698	1 417 720	1.32	0.71	Satisfactory: intervene to lower	Satisfactory: intervene to maintain
China, Hong Kong SAR[d]	4 396	6 660	7 689	1.81	0.84		
Dem. People's Rep. of Korea	16 304	23 348	27 370	1.56	0.94	Satisfactory: no intervention	Satisfactory: intervene to maintain

TABLE A.10 (*continued*)

Major area, region and country	Mid-year population (thousands) 1975	1998	2015	Average annual growth rate (percentage) 1975-1998	1998-2015	Governments' views and policies: View on population growth and type of intervention to modify growth	View and policy on immigration
Japan	111 524	126 281	126 070	0.54	-0.01	Satisfactory: no intervention	Satisfactory: intervene to maintain
Macau	253	459	512	2.59	0.64		
Mongolia	1 447	2 579	3 307	2.51	1.46	Satisfactory: intervene to maintain	Satisfactory: intervene to maintain
Republic of Korea	35 281	46 109	51 051	1.16	0.60	Satisfactory: no intervention	Satisfactory: intervene to lower
South-central Asia	885 832	1 440 711	1 839 330	2.11	1.44		
Afghanistan	15 378	21 354	36 781	1.43	3.20	Too high: no intervention	Satisfactory: intervene to maintain
Bangladesh	76 582	124 774	161 540	2.12	1.52	Too high: intervene to lower	Satisfactory: no intervention
Bhutan	1 178	2 004	3 113	2.31	2.59	Too low: no intervention	Too high: intervene to lower
India	620 701	982 223	1 211 665	2.00	1.23	Too high: intervene to lower	Satisfactory: intervene to maintain
Iran (Islamic Republic of)	33 344	65 758	83 054	2.95	1.37	Too high: intervene to lower	Too high: intervene to lower
Kazakhstan	14 136	16 319	16 919	0.62	0.21		
Kyrgyzstan	3 299	4 643	5 461	1.49	0.96		
Maldives	137	271	420	2.95	2.58	Too high: intervene to lower	Satisfactory: intervene to lower
Nepal	12 797	22 847	32 693	2.52	2.11	Too high: intervene to lower	Too high: intervene to lower
Pakistan	74 734	148 166	222 587	2.98	2.39	Too high: intervene to lower	Satisfactory: no intervention
Sri Lanka	13 603	18 455	21 883	1.33	1.00	Too high: intervene to lower	Satisfactory: intervene to maintain
Tajikistan	3 442	6 015	7 756	2.43	1.49		
Turkmenistan	2 520	4 309	5 575	2.33	1.52		
Uzbekistan	13 981	23 574	29 883	2.27	1.39		
South-eastern Asia	323 982	503 578	621 404	1.92	1.24		
Brunei Darussalam	161	315	410	2.93	1.55	Satisfactory: no intervention	Satisfactory: intervene to lower
Cambodia	7 098	10 716	14 403	1.79	1.74	Too high: intervene to lower	Satisfactory: intervene to maintain
East Timor	672	857	1 082	1.05	1.37		
Indonesia	135 666	206 338	250 383	1.82	1.14	Too high: intervene to lower	Too high: intervene to lower
Lao People's Dem. Republic	3 024	5 163	7 844	2.33	2.46	Too low: intervene to raise	Satisfactory: intervene to maintain
Malaysia	12 258	21 410	27 540	2.42	1.48	Too high: intervene to lower	Too high: intervene to lower
Myanmar	30 441	44 497	53 533	1.65	1.09	Satisfactory: no intervention	Satisfactory: intervene to maintain
Philippines	43 010	72 944	96 732	2.30	1.66	Too high: intervene to lower	Satisfactory: intervene to lower
Singapore	2 263	3 476	3 994	1.87	0.82	Satisfactory: intervene to maintain	Satisfactory: intervene to raise
Thailand	41 359	60 300	68 872	1.64	0.78	Too high: intervene to lower	Satisfactory: intervene to lower
Viet Nam	48 030	77 562	96 610	2.08	1.29	Too high: intervene to lower	Satisfactory: no intervention
Western Asia	98 807	179 949	252 443	2.61	1.99		
Armenia	2 826	3 536	3 810	0.98	0.44	Satisfactory: intervene to maintain	Satisfactory: no intervention
Azerbaijan	5 689	7 669	8 795	1.30	0.81		
Bahrain	272	595	762	3.40	1.46	Satisfactory: no intervention	Satisfactory: no intervention
Cyprus	609	771	866	1.03	0.68	Too low: intervene to raise	Satisfactory: intervene to lower
Gaza Strip	393	1 036	1 987	4.22	3.83		
Georgia	4 908	5 059	5 087	0.13	0.03	Too low: no intervention	Satisfactory: no intervention

TABLE A.10 (*continued*)

Major area, region and country	Mid-year population (thousands) 1975	1998	2015	Average annual growth rate (percentage) 1975-1998	1998-2015	Governments' views and policies: View on population growth and type of intervention to modify growth	View and policy on immigration
Iraq	11 020	21 800	34 062	2.97	2.63	Too low: intervene to raise	Satisfactory: intervene to maintain
Israel	3 455	5 984	7 592	2.39	1.40	Too low: intervene to raise	Too low: intervene to raise
Jordan	2 600	6 304	9 909	3.85	2.66	Too high: intervene to lower	Satisfactory: intervene to lower
Kuwait	1 007	1 811	2 622	2.55	2.18	Satisfactory: intervene to maintain	Satisfactory: intervene to lower
Lebanon	2 767	3 191	3 942	0.62	1.24	Satisfactory: no intervention	Too high: intervene to lower
Oman	880	2 382	4 103	4.33	3.20	Too low: intervene to raise	Too high: intervene to lower
Qatar	171	579	732	5.30	1.38	Too low: intervene to raise	Satisfactory: intervene to maintain
Saudi Arabia	7 251	20 181	32 623	4.45	2.83	Too low: intervene to raise	Too high: intervene to lower
Syrian Arab Republic	7 438	15 333	22 646	3.15	2.29	Satisfactory: no intervention	Satisfactory: intervene to maintain
Turkey	40 025	64 479	80 284	2.07	1.29	Too high: intervene to lower	Satisfactory: intervene to lower
United Arab Emirates	505	2 353	3 026	6.69	1.48	Too high: no intervention	Too high: intervene to lower
Yemen	6 991	16 887	29 596	3.83	3.30	Too high: intervene to lower	Too high: intervene to lower
Europe	676 390	728 871	719 307	0.32	-0.08		
Eastern Europe	285 708	308 291	297 893	0.33	-0.20		
Belarus	9 367	10 315	9 848	0.42	-0.27	Too low: intervene to raise	Satisfactory: intervene to maintain
Bulgaria	8 722	8 336	7 526	-0.20	-0.60	Too low: no intervention	Too high: intervene to maintain
Czech Republic	9 997	10 282	9 929	0.12	-0.21	Satisfactory: no intervention	Satisfactory: intervene to maintain
Hungary	10 532	10 116	9 408	-0.18	-0.43	Too low: intervene to raise	Satisfactory: intervene to lower
Poland	34 022	38 718	39 350	0.56	0.10	Satisfactory: no intervention	Satisfactory: intervene to maintain
Republic of Moldova	3 839	4 378	4 474	0.57	0.13		
Romania	21 245	22 474	21 067	0.24	-0.38	Too low: no intervention	Satisfactory: intervene to lower
Russian Federation	134 233	147 434	142 945	0.41	-0.18	Satisfactory: no intervention	Too high: intervene to lower
Slovakia	4 736	5 377	5 466	0.55	0.10		
Ukraine	49 016	50 861	47 880	0.16	-0.36	Too low: intervene to raise	Satisfactory: no intervention
Northern Europe	89 034	94 142	95 515	0.24	0.09		
Channel Islands	127	151	166	0.74	0.58		
Denmark	5 060	5 270	5 309	0.18	0.04	Satisfactory: no intervention	Too high: intervene to lower
Estonia	1 432	1 429	1 219	-0.01	-0.94	Satisfactory: no intervention	Too high: intervene to lower
Faeroe Islands	41	43	38	0.26	-0.71		
Finland	4 711	5 154	5 255	0.39	0.11	Satisfactory: no intervention	Satisfactory: intervene to lower
Iceland	218	276	313	1.03	0.74	Satisfactory: no intervention	Satisfactory: intervene to maintain
Ireland	3 177	3 681	4 168	0.64	0.73	Satisfactory: no intervention	Satisfactory: intervene to maintain
Isle of Man	60	77	93	1.11	1.11		
Latvia	2 474	2 424	2 063	-0.09	-0.95	Too low: no intervention	Too high: intervene to lower
Lithuania	3 308	3 694	3 521	0.48	-0.28	Satisfactory: intervene to raise	Satisfactory: intervene to lower
Norway	4 007	4 419	4 716	0.43	0.38	Satisfactory: no intervention	Satisfactory: intervene to lower

TABLE A.10 (*continued*)

Major area, region and country	Mid-year population (thousands) 1975	1998	2015	Average annual growth rate (percentage) 1975-1998	1998-2015	Governments' views and policies: View on population growth and type of intervention to modify growth	View and policy on immigration
Sweden	8 193	8 875	9 087	0.35	0.14	Satisfactory: no intervention	Satisfactory: intervene to maintain
United Kingdom	56 226	58 649	59 566	0.18	0.09	Satisfactory: no intervention	Too high: intervene to lower
Southern Europe	132 491	143 876	140 703	0.36	-0.13		
Albania	2 424	3 119	3 501	1.10	0.68	Satisfactory: intervene to maintain	Satisfactory: intervene to maintain
Andorra	25	72	125	4.59	3.21	Satisfactory: no intervention	Satisfactory: intervene to maintain
Bosnia and Herzegovina	3 747	3 675	4 377	-0.08	1.03		
Croatia	4 263	4 481	4 350	0.22	-0.17	Satisfactory: intervene to raise	Satisfactory: no intervention
Gibraltar	28	25	23	-0.36	-0.66		
Greece	9 047	10 600	10 378	0.69	-0.12	Too low: intervene to raise	Too high: intervene to lower
Holy See	1	0	1	-3.19	0.24	Satisfactory: no intervention	Satisfactory: intervene to maintain
Italy	55 441	57 369	54 448	0.15	-0.31	Satisfactory: no intervention	Satisfactory: intervene to lower
Malta	304	384	421	1.01	0.55	Satisfactory: no intervention	Satisfactory: no intervention
Portugal	9 093	9 869	9 661	0.36	-0.13	Too low: no intervention	Satisfactory: intervene to lower
San Marino	19	26	31	1.35	0.99	Satisfactory: intervene to maintain	Too high: intervene to lower
Slovenia	1 742	1 993	1 916	0.58	-0.23		
Spain	35 596	39 628	38 465	0.47	-0.18	Satisfactory: no intervention	Satisfactory: intervene to lower
The former Yugoslav Republic of Macedonia	1 676	1 999	2 189	0.77	0.53	Too high: intervene to lower	Too high: intervene to lower
Yugoslavia	9 085	10 635	10 819	0.68	0.10	Satisfactory: intervene to maintain	Satisfactory: no intervention
Western Europe	169 156	182 562	185 196	0.33	0.08		
Austria	7 579	8 140	8 329	0.31	0.13	Satisfactory: intervene to maintain	Too high: intervene to lower
Belgium	9 796	10 141	10 085	0.15	-0.03	Satisfactory: no intervention	Too high: intervene to lower
France	52 699	58 683	61 108	0.47	0.24	Satisfactory: intervene to raise	Too high: intervene to lower
Germany	78 679	82 133	81 574	0.19	-0.04	Satisfactory: no intervention	Too high: intervene to lower
Liechtenstein	23	32	38	1.43	1.06	Satisfactory: no intervention	Satisfactory: intervene to lower
Luxembourg	362	422	462	0.66	0.53	Satisfactory: intervene to maintain	Too high: intervene to lower
Monaco	25	33	38	1.18	0.90	Too low: intervene to raise	Satisfactory: intervene to lower
Netherlands	13 653	15 678	15 937	0.60	0.10	Satisfactory: no intervention	Too high: intervene to lower
Switzerland	6 339	7 299	7 625	0.61	0.26	Satisfactory: no intervention	Too high: intervene to lower
Latin America and the Caribbean	321 888	503 524	631 115	1.95	1.33		
Caribbean	27 171	37 351	43 853	1.38	0.94		
Anguilla	6	8	10	1.09	1.18		
Antigua and Barbuda	59	67	72	0.55	0.47	Satisfactory: intervene to maintain	Satisfactory: intervene to maintain
Aruba	62	94	185	1.81	3.98		
Bahamas	189	296	375	1.96	1.39	Satisfactory: no intervention	Too high: intervene to lower
Barbados	246	268	288	0.38	0.42	Satisfactory: no intervention	Satisfactory: no intervention
British Virgin Islands	11	20	30	2.71	2.38		

TABLE A.10 (*continued*)

Major area, region and country	Mid-year population (thousands) 1975	1998	2015	Average annual growth rate (percentage) 1975-1998	1998-2015	Governments' views and policies: View on population growth and type of intervention to modify growth	View and policy on immigration
Cayman Islands	14	36	61	4.03	3.15		
Cuba	9 306	11 116	11 646	0.77	0.27	Satisfactory: no intervention	Satisfactory: intervene to maintain
Dominica	72	71	72	-0.10	0.07	Too high: intervene to lower	Satisfactory: intervene to maintain
Dominican Republic	5 048	8 232	10 251	2.13	1.29	Too high: intervene to lower	Too high: no intervention
Grenada	92	93	100	0.07	0.40	Satisfactory: intervene to maintain	Satisfactory: no intervention
Guadeloupe	329	443	533	1.30	1.08		
Haiti	4 920	7 952	10 440	2.09	1.60	Too high: intervene to lower	Satisfactory: no intervention
Jamaica	2 013	2 538	2 945	1.01	0.87	Too high: intervene to lower	Satisfactory: no intervention
Martinique	329	389	432	0.74	0.61		
Montserrat	12	11	11	-0.41	-0.09		
Netherlands Antilles	166	213	245	1.07	0.84		
Puerto Rico	2 939	3 810	4 279	1.13	0.68		
Saint Kitts and Nevis	45	39	36	-0.66	-0.53	Too high: intervene to lower	Satisfactory: intervene to maintain
Saint Lucia	108	150	186	1.43	1.27	Too high: intervene to lower	Satisfactory: intervene to lower
Saint Vincent and Grenadines	93	112	125	0.84	0.62	Too high: intervene to lower	Satisfactory: no intervention
Trinidad and Tobago	1 012	1 283	1 420	1.03	0.60	Too high: intervene to lower	Satisfactory: intervene to maintain
Turks and Caicos Islands	6	16	27	3.84	3.12		
United States Virgin Islands	95	94	85	0.00	-0.59		
Central America	78 576	130 457	168 858	2.20	1.52		
Belize	134	230	318	2.35	1.91	Too low: no intervention	Too high: intervene to lower
Costa Rica	1 968	3 841	5 232	2.91	1.82	Too high: intervene to lower	Too high: intervene to lower
El Salvador	4 120	6 032	7 977	1.66	1.64	Too high: intervene to lower	Satisfactory: no intervention
Guatemala	6 018	10 801	16 385	2.54	2.45	Satisfactory: no intervention	Satisfactory: no intervention
Honduras	3 017	6 147	9 044	3.10	2.27	Satisfactory: no intervention	Satisfactory: intervene to lower
Mexico	59 099	95 831	119 178	2.10	1.28	Too high: intervene to lower	Satisfactory: intervene to lower
Nicaragua	2 498	4 807	7 271	2.85	2.43	Too high: intervene to lower	Satisfactory: no intervention
Panama	1 723	2 767	3 451	2.06	1.30	Satisfactory: no intervention	Satisfactory: intervene to maintain
South America	216 141	335 715	418 405	1.91	1.30		
Argentina	26 049	36 123	43 498	1.42	1.09	Satisfactory: no intervention	Satisfactory: intervene to maintain
Bolivia	4 759	7 957	11 219	2.24	2.02	Satisfactory: no intervention	Satisfactory: no intervention
Brazil	108 167	165 851	200 697	1.86	1.12	Satisfactory: no intervention	Satisfactory: intervene to maintain
Chile	10 337	14 824	17 912	1.57	1.11	Satisfactory: no intervention	Satisfactory: no intervention
Colombia	25 381	40 803	53 183	2.06	1.56	Satisfactory: no intervention	Satisfactory: no intervention
Ecuador	6 907	12 175	15 936	2.46	1.58	Satisfactory: no intervention	Satisfactory: no intervention
Falkland Islands (Malvinas)	2	2	2	0.54	0.46		
French Guiana	57	167	312	4.65	3.69		
Guyana	734	850	961	0.64	0.73	Satisfactory: no intervention	Satisfactory: intervene to raise
Paraguay	2 659	5 222	7 773	2.93	2.34	Satisfactory: no intervention	Too low: intervene to raise
Peru	15 161	24 797	31 876	2.14	1.48	Too high: intervene to lower	Satisfactory: no intervention

TABLE A.10 (*continued*)

Major area, region and country	Mid-year population (thousands) 1975	1998	2015	Average annual growth rate (percentage) 1975-1998	1998-2015	Governments' views and policies: View on population growth and type of intervention to modify growth	View and policy on immigration
Suriname	364	414	478	0.55	0.85	Satisfactory: no intervention	Too high: no intervention
Uruguay	2 829	3 289	3 681	0.66	0.66	Too low: intervene to raise	Too low: intervene to raise
Venezuela	12 734	23 242	30 877	2.62	1.67	Satisfactory: no intervention	Satisfactory: no intervention
Northern America	243 483	304 716	343 165	0.98	0.70		
Bermuda	53	64	72	0.79	0.71		
Canada	23 209	30 563	35 301	1.20	0.85	Satisfactory: no intervention	Satisfactory: intervene to lower
Greenland	50	56	58	0.53	0.20		
Saint Pierre and Miquelon	6	7	7	0.44	0.33		
United States of America	220 165	274 028	307 727	0.95	0.68	Satisfactory: no intervention	Satisfactory: intervene to maintain
Oceania	21 436	29 644	36 089	1.41	1.16		
Australia/New Zealand	16 984	22 316	25 853	1.19	0.87		
Australia	13 900	18 520	21 477	1.25	0.87	Satisfactory: no intervention	Satisfactory: intervene to maintain
New Zealand	3 083	3 796	4 376	0.90	0.84	Satisfactory: no intervention	Too low: intervene to raise
Melanesia	3 730	6 201	8 667	2.21	1.97		
Fiji	576	796	994	1.41	1.31	Satisfactory: intervene to maintain	Satisfactory: intervene to maintain
New Caledonia	133	206	259	1.90	1.34		
Papua New Guinea	2 729	4 600	6 482	2.27	2.02	Too high: intervene to lower	Satisfactory: no intervention
Solomon Islands	190	417	665	3.41	2.74	Too high: intervene to lower	Satisfactory: intervene to maintain
Vanuatu	102	182	266	2.50	2.26	Satisfactory: no intervention	Satisfactory: no intervention
Micronesia	284	516	773	2.60	2.37		
Guam	95	161	205	2.28	1.42		
Kiribati	55	81	103	1.65	1.43	Too high: intervene to lower	Satisfactory: intervene to maintain
Marshall Islands	30	60	99	3.09	2.92	Too high: intervene to lower	Satisfactory: intervene to lower
Micronesia (Fed. States of)	71	114	158	2.05	1.93	Too high: intervene to lower	Too high: intervene to lower
Nauru	6	11	15	2.34	1.79	Too low: intervene to raise	Satisfactory: intervene to maintain
Northern Mariana Islands	15	70	165	6.73	5.04		
Palau	11	19	27	2.34	2.25		
Polynesia	439	611	797	1.44	1.56		
American Samoa	30	63	110	3.31	3.23		
Cook Islands	19	19	22	0.03	0.73		
French Polynesia	130	227	290	2.43	1.45		
Niue	4	2	2	-3.25	-1.38		
Pitcairn	0	0	0	-1.83	0.13		
Samoa	151	174	236	0.63	1.78	Too high: intervene to lower	Too high: intervene to maintain
Tokelau	2	1	2	-0.25	0.03		

TABLE A. 10 (*continued*)

Major area, region and country	Mid-year population (thousands)			Average annual growth rate (percentage)		Governments' views and policies	
	1975	1998	2015	1975-1998	1998-2015	View on population growth and type of intervention to modify growth	View and policy on immigration
Tonga	88	98	103	0.46	0.27	Too low: no intervention	Satisfactory: intervene to maintain
Tuvalu	6	11	17	2.49	2.44	Too high: intervene to lower	Satisfactory: intervene to maintain
Wallis and Futuna Islands	9	14	16	1.96	0.69		

Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9); Population Policy Data Bank maintained by the Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat.

[a]Comprising all regions of Europe and Northern America, Australia/New Zealand and Japan.

[b]Comprising all regions of Africa, Asia (excluding Japan), Latin America and the Caribbean, and Melanesia, Micronesia and Polynesia.

[c]For statistical purposes, the data for China do not include Hong Kong Special Administrative Region (Hong Kong SAR).

[d]As of 1 July 1997, Hong Kong became a Special Administrative Region (SAR) of China.

TABLE A.11. FERTILITY TRENDS, MAJOR AREAS, REGIONS AND COUNTRIES, 1970-2000, AND GOVERNMENTS' VIEWS AND POLICIES ON FERTILITY

Major area, region and country	Total fertility rate (per woman) 1970-1975	1995-2000	Annual percentage change, 1970-1975 to 1995-2000	View on fertility and type of intervention to modify fertility
World	4.48	2.71	-2.0	
More developed regions[a]	2.11	1.57	-1.2	
Less developed regions[b]	5.43	3.00	-2.4	
Least developed countries	6.71	5.05	-1.1	
Africa	6.60	5.06	-1.1	
Eastern Africa	6.97	5.79	-0.7	
Burundi	6.80	6.28	-0.3	Too high: intervene to lower
Comoros	7.05	4.80	-1.5	Too high: intervene to lower
Djibouti	6.70	5.30	-0.9	Satisfactory: no intervention
Eritrea	6.52	5.70	-0.5	
Ethiopia	6.80	6.30	-0.3	Too high: intervene to lower
Kenya	8.12	4.45	-2.4	Too high: intervene to lower
Madagascar	6.55	5.40	-0.8	Too high: intervene to lower
Malawi	7.40	6.75	-0.4	Too high: intervene to lower
Mauritius	3.25	1.91	-2.1	Satisfactory: intervene to maintain
Mozambique	6.50	6.25	-0.2	Too high: intervene to lower
Réunion	3.93	2.10	-2.5	
Rwanda	8.29	6.20	-1.2	Too high: intervene to lower
Somalia	7.25	7.25	0.0	Satisfactory: no intervention
Uganda	6.90	7.10	0.1	Too high: intervene to lower
United Republic of Tanzania	6.80	5.48	-0.9	Too high: intervene to lower
Zambia	6.90	5.55	-0.9	Too high: intervene to lower
Zimbabwe	7.20	3.80	-2.6	Too high: intervene to lower
Middle Africa	6.31	6.17	-0.1	
Angola	6.60	6.80	0.1	Too high: no intervention
Cameroon	6.30	5.30	-0.7	Too high: intervene to lower
Central African Republic	5.72	4.90	-0.6	Too high: no intervention
Chad	6.60	6.07	-0.3	Satisfactory: no intervention
Congo	6.29	6.06	-0.2	Too high: intervene to lower
Dem. Republic of the Congo	6.30	6.43	0.1	Satisfactory: no intervention
Equatorial Guinea	5.68	5.58	-0.1	Satisfactory: intervene to maintain
Gabon	4.26	5.40	0.9	Too low: intervene to raise
Northern Africa	6.34	3.58	-2.3	
Algeria	7.38	3.81	-2.6	Too high: intervene to lower
Egypt	5.54	3.40	-1.9	Too high: intervene to lower
Libyan Arab Jamahiriya	7.59	3.80	-2.8	Satisfactory: no intervention
Morocco	6.89	3.10	-3.2	Too high: intervene to lower
Sudan	6.67	4.61	-1.5	Too high: intervene to lower
Tunisia	6.21	2.55	-3.6	Too high: intervene to lower
Western Sahara	6.53	3.98	-2.0	
Southern Africa	4.96	3.43	-1.5	
Botswana	6.60	4.35	-1.7	Too high: intervene to lower
Lesotho	5.74	4.75	-0.8	Too high: intervene to lower
Namibia	6.00	4.90	-0.8	Too high: no intervention
South Africa	4.80	3.25	-1.6	Too high: intervene to lower
Swaziland	6.50	4.70	-1.3	Too high: intervene to lower
Western Africa	6.99	5.47	-1.0	
Benin	7.06	5.80	-0.8	Satisfactory: no intervention
Burkina Faso	7.80	6.57	-0.7	Too high: intervene to lower
Cape Verde	7.00	3.56	-2.7	Too high: intervene to lower
Côte d'Ivoire	7.41	5.10	-1.5	Satisfactory: intervene to raise

TABLE A.11 (*continued*)

Major area, region and country	Total fertility rate (per woman) 1970-1975	1995-2000	Annual percentage change, 1970-1975 to 1995-2000	View on fertility and type of intervention to modify fertility
Gambia	6.50	5.20	-0.9	Too high: intervene to lower
Ghana	6.64	5.15	-1.0	Too high: intervene to lower
Guinea	7.00	5.51	-1.0	Too high: intervene to lower
Guinea-Bissau	5.38	5.75	0.3	Too high: no intervention
Liberia	6.80	6.31	-0.3	Too high: intervene to lower
Mali	7.11	6.60	-0.3	Too high: intervene to lower
Mauritania	6.50	5.50	-0.7	Satisfactory: no intervention
Niger	8.12	6.84	-0.7	Too high: intervene to lower
Nigeria	6.90	5.15	-1.2	Too high: intervene to lower
Senegal	7.00	5.57	-0.9	Too high: intervene to lower
Sierra Leone	6.50	6.06	-0.3	Too high: intervene to lower
Togo	6.58	6.05	-0.3	Satisfactory: intervene to maintain
Asia	5.09	2.60	-2.7	
Eastern Asia	4.49	1.77	-3.7	
China[c]	4.86	1.80	-4.0[c]	Satisfactory: intervene to lower
China, Hong Kong SAR[d]	2.89	1.32	-3.1	
Dem. People's Rep. of Korea	5.69	2.05	-4.1	Satisfactory: intervene to maintain
Japan	2.07	1.43	-1.5	Too low: no intervention
Macau	3.20	1.40	-3.3	
Mongolia	7.33	2.60	-4.1	Satisfactory: intervene to maintain
Republic of Korea	4.28	1.65	-3.8	Satisfactory: no intervention
South-central Asia	5.72	3.36	-2.1	
Afghanistan	7.14	6.90	-0.1	Too high: no intervention
Bangladesh	7.02	3.11	-3.3	Too high: intervene to lower
Bhutan	5.90	5.50	-0.3	Satisfactory: no intervention
India	5.43	3.13	-2.2	Too high: intervene to lower
Iran (Islamic Republic of)	6.54	2.80	-3.4	Too high: intervene to lower
Kazakhstan	3.46	2.30	-1.6	
Kyrgyzstan	4.73	3.21	-1.5	
Maldives	7.00	5.40	-1.0	Too high: intervene to lower
Nepal	6.30	4.45	-1.4	Too high: intervene to lower
Pakistan	7.00	5.03	-1.3	Too high: intervene to lower
Sri Lanka	4.00	2.10	-2.6	Too high: intervene to lower
Tajikistan	6.83	4.15	-2.0	
Turkmenistan	6.19	3.60	-2.2	
Uzbekistan	6.01	3.45	-2.2	
South-eastern Asia	5.31	2.69	-2.7	
Brunei Darussalam	5.40	2.80	-2.6	Satisfactory: no intervention
Cambodia	5.54	4.60	-0.7	Too high: intervene to lower
East Timor	6.15	4.35	-1.4	
Indonesia	5.10	2.58	-2.7	Too high: intervene to lower
Lao People's Dem. Republic	6.15	5.75	-0.3	Satisfactory: intervene to maintain
Malaysia	5.15	3.18	-1.9	Too high: intervene to lower
Myanmar	5.75	2.40	-3.5	Too high: no intervention
Philippines	5.50	3.62	-1.7	Too high: intervene to lower
Singapore	2.62	1.68	-1.8	Too low: intervene to raise
Thailand	4.99	1.74	-4.2	Too high: intervene to lower
Viet Nam	5.85	2.60	-3.2	Too high: intervene to lower
Western Asia	5.57	3.77	-1.6	
Armenia	3.04	1.70	-2.3	Satisfactory: intervene to raise
Azerbaijan	4.29	1.99	-3.1	
Bahrain	5.95	2.90	-2.9	Satisfactory: intervene to lower
Cyprus	2.49	2.03	-0.8	Too low: intervene to raise

TABLE A.11 (*continued*)

Major area, region and country	Total fertility rate (per woman) 1970-1975	1995-2000	Annual percentage change, 1970-1975 to 1995-2000	View on fertility and type of intervention to modify fertility
Gaza Strip	7.60	7.30	-0.2	
Georgia	2.60	1.92	-1.2	Too low: intervene to raise
Iraq	7.11	5.25	-1.2	Too low: intervene to raise
Israel	3.77	2.68	-1.4	Too low: intervene to raise
Jordan	7.79	4.86	-1.9	Too high: intervene to lower
Kuwait	6.90	2.89	-3.5	Satisfactory: intervene to maintain
Lebanon	4.92	2.69	-2.4	Satisfactory: no intervention
Oman	7.20	5.85	-0.8	Satisfactory: intervene to maintain
Qatar	6.77	3.74	-2.4	Satisfactory: intervene to maintain
Saudi Arabia	7.30	5.80	-0.9	Satisfactory: intervene to maintain
Syrian Arab Republic	7.69	4.00	-2.6	Satisfactory: no intervention
Turkey	5.04	2.50	-2.8	Too high: intervene to lower
United Arab Emirates	6.36	3.42	-2.5	Satisfactory: no intervention
Yemen	7.61	7.60	0.0	Too high: intervene to lower
Europe	2.14	1.42	-1.6	
Eastern Europe	2.11	1.36	-1.8	
Belarus	2.24	1.36	-2.0	Satisfactory: intervene to raise
Bulgaria	2.17	1.23	-2.3	Too low: intervene to raise
Czech Republic	2.21	1.19	-2.5	Satisfactory: no intervention
Hungary	2.09	1.37	-1.7	Too low: intervene to raise
Poland	2.25	1.53	-1.5	Satisfactory: no intervention
Republic of Moldova	2.56	1.76	-1.5	
Romania	2.63	1.17	-3.2	Too low: intervene to raise
Russian Federation	1.98	1.35	-1.6	Too low: no intervention
Slovakia	2.51	1.39	-2.4	
Ukraine	2.04	1.38	-1.6	Too low: intervene to raise
Northern Europe	2.08	1.69	-0.8	
Denmark	1.97	1.72	-0.5	Satisfactory: no intervention
Estonia	2.15	1.29	-2.1	Too low: intervene to raise
Finland	1.62	1.73	0.3	Satisfactory: intervene to raise
Iceland	2.84	2.10	-1.2	Satisfactory: no intervention
Ireland	3.82	1.90	-2.8	Satisfactory: intervene to maintain
Latvia	2.00	1.25	-1.9	Too low: intervene to raise
Lithuania	2.32	1.43	-1.9	Satisfactory: intervene to raise
Norway	2.25	1.85	-0.8	Satisfactory: no intervention
Sweden	1.89	1.57	-0.7	Satisfactory: no intervention
United Kingdom	2.04	1.72	-0.7	Satisfactory: no intervention
Southern Europe	2.53	1.31	-2.6	
Albania	4.66	2.50	-2.5	Satisfactory: intervene to maintain
Bosnia and Herzegovina	2.63	1.35	-2.7	
Croatia	1.96	1.56	-0.9	Too low: intervene to raise
Greece	2.32	1.28	-2.4	Too low: intervene to raise
Italy	2.28	1.20	-2.6	Satisfactory: no intervention
Malta	2.07	1.89	-0.4	Satisfactory: no intervention
Portugal	2.75	1.37	-2.8	Too low: no intervention
Slovenia	2.19	1.26	-2.2	
Spain	2.89	1.15	-3.7	Satisfactory: no intervention
The former Yugoslav Republic of Macedonia	2.96	2.06	-1.5	Too high: intervene to lower
Yugoslavia	2.36	1.84	-1.0	Satisfactory: intervene to maintain
Western Europe	1.92	1.48	-1.0	
Austria	2.02	1.41	-1.4	Satisfactory: no intervention
Belgium	1.93	1.55	-0.9	Satisfactory: no intervention
France	2.31	1.71	-1.2	Too low: intervene to raise

TABLE A.11 (*continued*)

Major area, region and country	Total fertility rate (per woman) 1970-1975	1995-2000	Annual percentage change, 1970-1975 to 1995-2000	View on fertility and type of intervention to modify fertility
Germany	1.64	1.30	-0.9	Too low: no intervention
Luxembourg	1.97	1.67	-0.7	Too low: intervene to raise
Netherlands	1.97	1.50	-1.1	Satisfactory: no intervention
Switzerland	1.82	1.47	-0.8	Too low: no intervention
Latin America and the Caribbean	5.03	2.69	-2.5	
Caribbean	4.37	2.55	-2.2	
Bahamas	3.44	2.60	-1.1	Satisfactory: no intervention
Barbados	2.74	1.50	-2.4	Satisfactory: no intervention
Cuba	3.55	1.55	-3.3	Satisfactory: no intervention
Dominican Republic	5.63	2.80	-2.8	Too high: intervene to lower
Guadeloupe	4.49	1.90	-3.4	
Haiti	5.76	4.38	-1.1	Too high: intervene to lower
Jamaica	5.00	2.50	-2.8	Too high: intervene to lower
Martinique	4.08	1.75	-3.4	
Netherlands Antilles	2.65	2.20	-0.7	
Puerto Rico	2.99	2.11	-1.4	
Trinidad and Tobago	3.45	1.65	-2.9	Too high: intervene to lower
Central America	6.43	3.05	-3.0	
Belize	6.25	3.66	-2.1	Too high: no intervention
Costa Rica	4.34	2.83	-1.7	Too high: intervene to lower
El Salvador	6.10	3.17	-2.6	Too high: intervene to lower
Guatemala	6.45	4.93	-1.1	Too high: intervene to lower
Honduras	7.05	4.30	-2.0	Too high: intervene to lower
Mexico	6.52	2.75	-3.5	Too high: intervene to lower
Nicaragua	6.79	4.42	-1.7	Too high: intervene to lower
Panama	4.94	2.63	-2.5	Satisfactory: no intervention
South America	4.65	2.58	-2.4	
Argentina	3.15	2.62	-0.7	Satisfactory: no intervention
Bolivia	6.50	4.36	-1.6	Satisfactory: no intervention
Brazil	4.72	2.27	-2.9	Satisfactory: no intervention
Chile	3.63	2.44	-1.6	Satisfactory: intervene to maintain
Colombia	5.00	2.80	-2.3	Satisfactory: no intervention
Ecuador	6.00	3.10	-2.6	Too high: intervene to lower
Guyana	4.90	2.32	-3.0	Satisfactory: no intervention
Paraguay	5.65	4.17	-1.2	Satisfactory: no intervention
Peru	6.00	2.98	-2.8	Too high: intervene to lower
Suriname	5.29	2.21	-3.5	Satisfactory: no intervention
Uruguay	3.00	2.40	-0.9	Too low: intervene to raise
Venezuela	4.94	2.98	-2.0	Satisfactory: intervene to lower
Northern America	2.01	1.94	-0.1	
Canada	1.97	1.55	-1.0	Satisfactory: no intervention
United States of America	2.02	1.99	-0.1	Satisfactory: no intervention
Oceania	3.21	2.38	-1.2	
Australia/New Zealand	2.58	1.83	-1.4	
Australia	2.53	1.79	-1.4	Satisfactory: no intervention
New Zealand	2.80	2.01	-1.3	Satisfactory: no intervention
Melanesia	5.78	4.28	-1.2	
Fiji	4.20	2.73	-1.7	Too high: intervene to lower
New Caledonia	4.94	2.70	-2.4	
Papua New Guinea	6.08	4.60	-1.1	Too high: intervene to lower

TABLE A.11 (*continued*)

Major area, region and country	Total fertility rate (per woman) 1970-1975	1995-2000	Annual percentage change, 1970-1975 to 1995-2000	View on fertility and type of intervention to modify fertility
Solomon Islands	7.23	4.85	-1.6	Too high: intervene to lower
Vanuatu	6.50	4.30	-1.7	Satisfactory: no intervention
Micronesia	5.91	4.08	-1.5	
Guam	4.12	3.40	-0.8	
Polynesia	6.08	3.38	-2.3	
French Polynesia	5.15	2.85	-2.4	
Samoa	6.93	4.15	-2.1	Too high: intervene to lower

Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).
[a]Comprising all regions of Europe and Northern America, Australia/New Zealand and Japan.
[b]Comprising all regions of Africa, Asia (excluding Japan), Latin America and the Caribbean, and Melanesia, Micronesia and Polynesia.
[c]For statistical purposes, the data for China do not include Hong Kong Special Administrative Region (Hong Kong SAR).
[d]As of 1 July 1997, Hong Kong became a Special Administrative Region (SAR) of China.

TABLE A.12. AGE PATTERN OF FERTILITY, MAJOR AREAS, REGIONS AND COUNTRIES, 1995-2000

Major area, region and country	Total fertility rate (per woman)	Age-specific fertility rate (per 1,000 women) 15-20	20-25	25-30	30-35	35-40	40-45	45-50	Births (thousands)	Percentage of births to women Under age 20	Aged 35 or over
World	2.71	64.6	167.6	155.4	89.8	44.4	16.4	4.5	649 050	13	10
More developed regions[a]	1.57	30.9	84.3	98.1	69.3	25.7	4.6	0.2	66 120	9	11
Less developed regions[b]	3.00	71.4	185.7	169.2	95.8	50.5	20.7	6.3	582 930	14	10
Least developed countries	5.05	128.4	243.2	238.9	187.2	126.1	64.3	22.7	117 209	18	13
Africa	5.06	118.6	245.1	245.9	188.4	126.4	64.1	22.8	140 574	17	14
Eastern Africa	5.79	131.8	280.9	276.0	214.2	144.0	81.3	29.2	49 150	17	13
Burundi	6.28	54.7	237.1	303.3	259.5	199.3	112.3	89.4	1 358	7	23
Comoros	4.80	83.3	229.0	252.6	199.7	125.3	52.9	17.7	119	13	12
Djibouti	5.30	30.5	150.5	263.2	276.4	211.6	95.6	32.2	115	4	24
Eritrea	5.70	118.8	241.2	261.4	224.3	168.2	94.9	31.2	717	15	17
Ethiopia	6.30	152.3	320.3	309.5	246.0	125.7	79.3	27.0	13 148	17	12
Kenya	4.45	95.3	230.0	220.4	157.1	111.4	46.5	29.3	4 914	17	12
Madagascar	5.40	137.2	250.6	251.6	197.6	154.4	72.4	16.2	3 000	16	16
Malawi	6.75	162.0	307.6	292.7	249.2	183.5	105.9	49.2	2 449	18	15
Mauritius	1.91	37.4	121.9	111.5	66.9	33.6	9.6	1.1	93	11	11
Mozambique	6.25	127.6	300.2	275.4	189.4	166.1	146.5	44.8	4 033	15	19
Réunion	2.10	20.0	95.4	161.5	92.3	41.3	9.5	0.1	62	5	10
Rwanda	6.20	56.4	240.5	356.4	270.2	185.3	99.7	31.5	1 405	8	16
Somalia	7.25	213.2	340.8	317.6	259.6	185.6	104.4	29.0	2 390	22	14
Uganda	7.10	180.3	336.5	323.8	271.2	200.2	85.2	22.7	5 197	20	12
United Republic of Tanzania	5.48	124.9	272.5	262.8	193.8	137.6	77.5	25.8	6 518	17	13
Zambia	5.55	134.0	277.6	264.0	199.2	144.9	71.1	19.2	1 846	19	11
Zimbabwe	3.80	89.0	200.3	189.9	143.3	91.2	37.5	8.7	1 776	16	11
Middle Africa	6.17	196.2	300.4	268.5	218.1	151.4	79.4	20.3	20 027	23	13
Angola	6.80	218.6	327.9	295.2	240.3	167.0	92.5	18.5	2 884	23	13
Cameroon	5.30	139.7	271.7	238.6	188.5	136.8	68.4	16.2	2 781	19	13
Central African Republic	4.90	142.2	240.1	238.6	179.8	108.3	49.5	21.5	650	20	12
Chad	6.07	185.3	310.8	288.8	220.6	141.7	56.5	10.5	1 579	22	11
Congo	6.06	140.9	261.1	278.3	242.1	174.9	87.3	27.5	600	17	15
Dem. Republic of the Congo	6.43	217.3	309.0	271.5	223.9	156.2	85.1	23.0	11 203	24	12
Equatorial Guinea	5.58	178.0	283.4	254.7	190.9	127.2	65.4	16.4	88	22	13
Gabon	5.40	172.3	259.8	205.4	189.0	140.8	86.3	26.5	216	21	17
Northern Africa	3.58	49.8	165.1	192.7	153.0	100.4	44.2	11.2	22 840	10	16
Algeria	3.81	24.5	138.5	212.1	181.9	134.5	58.6	11.9	4 345	5	19
Egypt	3.40	65.4	194.6	195.6	126.6	70.1	23.0	4.7	8 607	13	11
Libyan Arab Jamahiriya	3.80	55.5	195.9	205.8	159.5	96.2	40.4	6.6	769	11	12
Morocco	3.10	49.5	141.2	134.1	123.2	94.2	64.0	13.8	3 479	11	20
Sudan	4.61	52.1	172.5	236.1	212.6	151.5	68.9	28.8	4 642	9	20

TABLE A.12 (*continued*)

Major area, region and country	Total fertility rate (per woman)	Age-specific fertility rate (per 1,000 women) 15-20	20-25	25-30	30-35	35-40	40-45	45-50	Births (thousands)	Percentage of births to women Under age 20	Aged 35 or over
Tunisia	2.55	12.8	85.2	147.4	143.3	82.6	35.7	3.1	954	3	19
Western Sahara	3.98	53.4	162.1	244.0	170.2	103.4	45.1	17.9	42	9	14
Southern Africa	3.43	71.3	176.8	186.4	127.7	76.3	34.6	13.3	6 370	13	13
Botswana	4.35	77.9	187.9	247.7	176.7	111.3	49.3	19.2	263	13	13
Lesotho	4.75	85.5	230.2	226.9	191.1	131.4	61.3	23.6	360	13	16
Namibia	4.90	104.9	221.1	243.7	180.1	131.4	74.8	24.0	293	15	16
South Africa	3.25	68.2	170.3	178.8	120.0	69.8	31.0	11.9	5 275	13	13
Swaziland	4.70	89.6	231.8	228.3	176.4	123.6	60.2	30.2	179	13	15
Western Africa	5.47	135.6	263.6	263.2	196.0	136.4	68.0	31.4	42 186	18	13
Benin	5.80	115.7	262.4	271.6	232.7	176.8	75.4	25.6	1 182	15	17
Burkina Faso	6.57	157.4	303.5	282.0	235.7	195.1	96.8	43.4	2 571	18	15
Cape Verde	3.56	79.0	165.5	177.2	133.9	104.0	42.4	10.0	65	14	15
Côte d'Ivoire	5.10	132.6	234.4	231.0	196.4	141.3	64.7	19.6	2 641	20	13
Gambia	5.20	154.8	257.7	252.1	176.7	119.5	54.7	24.5	245	18	14
Ghana	5.15	113.1	231.8	242.3	196.3	141.9	81.8	22.7	3 536	16	16
Guinea	5.51	193.4	285.4	248.5	183.6	123.2	48.7	19.3	1 535	25	11
Guinea-Bissau	5.75	190.0	300.0	255.1	191.8	128.2	67.7	17.3	242	22	13
Liberia	6.31	213.1	261.0	268.6	234.5	172.8	82.0	29.0	580	30	11
Mali	6.60	181.0	305.7	302.2	237.4	192.4	83.5	17.8	2 484	22	13
Mauritania	5.50	134.8	249.2	267.9	207.9	139.5	67.0	33.7	506	18	14
Niger	6.84	198.5	326.1	318.7	233.6	169.5	87.4	34.3	2 422	21	13
Nigeria	5.15	121.0	257.4	261.4	180.6	116.0	58.1	35.6	20 439	17	12
Senegal	5.57	119.0	244.6	258.3	219.3	161.5	82.9	28.4	1 781	16	16
Sierra Leone	6.06	202.0	317.7	271.3	200.9	132.6	70.0	17.5	1 052	22	12
Togo	6.05	119.6	267.2	267.2	223.6	179.2	93.7	59.9	904	15	18
Asia	2.60	57.1	172.8	157.2	79.6	36.2	13.2	3.7	389 763	12	8
Eastern Asia	1.77	5.0	142.6	141.4	49.6	10.7	3.4	1.2	114 007	1	3
China[c]	1.80	5.0	155.9	139.3	45.4	9.4	3.6	1.4	101 224	1	3
China, Hong Kong SAR[d]	1.32	7.4	45.1	91.9	82.9	31.7	4.8	0.3	343	2	17
Dem. People's Rep. of Korea	2.05	1.6	61.2	249.6	79.3	14.8	2.8	0.8	2 421	0	3
Japan	1.43	3.7	42.0	125.8	90.4	21.7	2.3	0.0	6 269	1	8
Macau	1.40	5.9	52.9	102.8	76.4	37.2	4.2	0.6	30	1	18
Mongolia	2.60	47.0	154.9	158.2	91.5	49.9	15.9	2.6	294	11	9
Republic of Korea	1.65	4.0	70.6	178.9	62.4	12.2	1.7	0.3	3 425	1	4
South-central Asia	3.36	102.7	217.2	175.2	102.1	50.3	17.8	5.9	192 882	19	8
Afghanistan	6.90	153.2	329.8	336.7	274.6	182.2	86.9	16.6	5 435	14	13
Bangladesh	3.11	115.0	180.7	153.9	96.1	50.2	16.3	9.7	17 080	25	7

TABLE A.12 (*continued*)

Major area, region and country	Total fertility rate (per woman)	Age-specific fertility rate (per 1,000 women) 15-20	20-25	25-30	30-35	35-40	40-45	45-50	Births (thousands)	Percentage of births to women Under age 20	Aged 35 or over
Bhutan	5.50	70.9	241.0	291.0	251.1	164.6	70.9	10.6	374	9	16
India	3.13	112.2	224.0	156.9	81.9	36.2	11.6	3.1	123 917	21	6
Iran (Islamic Republic of)	2.80	29.3	127.0	206.3	120.2	59.6	15.9	1.7	7 157	8	9
Kazakhstan	2.30	53.5	177.9	127.6	66.8	27.6	6.9	0.5	1 501	13	7
Kyrgyzstan	3.21	40.4	229.1	182.9	111.6	55.2	19.2	3.2	591	8	10
Maldives	5.40	54.2	206.5	272.7	215.6	175.8	100.4	54.9	47	9	21
Nepal	4.45	120.0	257.2	224.9	151.7	91.6	33.5	11.0	3 893	18	10
Pakistan	5.03	89.6	239.8	266.2	201.6	123.5	56.4	28.0	26 421	12	14
Sri Lanka	2.10	20.3	94.5	157.9	93.2	43.8	9.5	0.9	1 634	6	11
Tajikistan	4.15	34.9	250.7	229.1	167.7	97.9	42.3	7.5	949	6	13
Turkmenistan	3.60	20.2	190.1	239.0	157.0	79.9	30.2	3.6	610	4	13
Uzbekistan	3.45	35.2	242.0	203.4	126.2	59.3	20.7	2.8	3 274	6	9
South-eastern Asia	2.69	47.5	143.4	154.3	103.8	61.4	24.0	3.1	57 753	10	12
Brunei Darussalam	2.80	33.2	128.2	178.6	124.2	71.0	21.5	3.3	34	7	17
Cambodia	4.60	13.8	164.6	238.1	211.4	170.1	122.0	0.0	1 816	2	27
East Timor	4.35	36.9	182.9	240.0	211.3	136.0	55.7	7.4	135	5	19
Indonesia	2.58	57.8	143.8	145.1	92.4	53.6	21.1	2.2	23 272	13	11
Lao People's Dem. Republic	5.75	103.6	267.7	259.6	221.7	171.2	97.3	28.9	1 009	13	18
Malaysia	3.18	25.4	140.8	209.0	147.2	83.6	27.3	2.7	2 642	5	15
Myanmar	2.40	26.3	91.6	135.2	115.7	76.8	26.4	8.0	4 689	7	18
Philippines	3.62	43.4	168.7	192.6	160.7	106.4	44.9	7.2	10 304	8	16
Singapore	1.68	7.4	51.0	125.6	104.8	40.6	6.4	0.0	256	2	16
Thailand	1.74	69.6	139.2	87.0	34.8	13.9	3.5	0.0	4 997	20	4
Viet Nam	2.60	27.4	144.5	182.2	102.9	49.0	13.0	0.9	8 600	6	9
Western Asia	3.77	57.1	175.1	205.6	149.8	100.3	48.3	17.5	25 121	10	16
Armenia	1.70	40.8	155.7	87.0	39.1	13.6	3.4	0.3	236	14	6
Azerbaijan	1.99	16.7	137.7	133.7	71.6	29.1	8.4	0.8	641	5	9
Bahrain	2.90	21.8	120.1	183.2	130.7	80.5	31.3	12.0	60	4	21
Cyprus	2.03	17.1	117.0	135.8	89.6	38.3	7.6	0.6	55	5	12
Gaza Strip	7.30	142.2	335.8	342.8	285.4	227.2	121.5	5.1	238	15	14
Georgia	1.92	46.5	155.1	105.2	51.1	20.7	5.0	0.4	356	13	7
Iraq	5.25	45.2	183.8	252.0	248.9	199.5	88.2	32.6	3 937	6	21
Israel	2.68	18.8	118.3	186.8	130.6	65.5	14.9	1.1	582	4	14
Jordan	4.86	42.8	190.5	254.7	229.4	164.3	71.0	19.4	1 078	7	16
Kuwait	2.89	34.0	141.7	191.0	123.2	68.2	16.2	2.9	202	8	14
Lebanon	2.69	25.5	117.0	186.9	120.2	63.2	21.9	3.7	374	5	13
Oman	5.85	79.6	231.7	269.1	249.2	182.5	95.9	62.0	415	12	18
Qatar	3.74	65.5	229.7	235.4	130.4	61.2	20.2	4.7	52	13	12
Saudi Arabia	5.80	112.5	183.3	226.2	213.4	222.7	168.2	33.6	3 366	17	24

TABLE A.12 (*continued*)

Major area, region and country	Total fertility rate (per woman)	Age-specific fertility rate (per 1,000 women) 15-20	20-25	25-30	30-35	35-40	40-45	45-50	Births (thousands)	Percentage of births to women Under age 20	Aged 35 or over
Syrian Arab Republic	4.00	44.3	167.8	266.8	174.3	102.2	38.5	6.1	2 305	9	12
Turkey	2.50	43.9	149.2	159.4	90.2	44.2	11.7	1.4	7 053	10	9
United Arab Emirates	3.42	73.4	191.0	185.8	126.0	67.9	31.2	9.1	215	15	16
Yemen	7.60	101.8	279.7	305.5	285.8	253.8	171.8	121.6	3 954	11	23
Europe	1.42	25.3	84.2	88.0	59.7	22.5	4.2	0.2	37 466	8	10
Eastern Europe	1.36	37.9	113.7	71.2	33.5	13.0	2.9	0.1	15 170	15	6
Belarus	1.36	35.6	125.7	68.0	29.6	10.6	2.2	0.3	506	14	5
Bulgaria	1.23	48.5	113.4	55.8	20.4	6.6	1.2	0.0	366	19	3
Czech Republic	1.19	23.1	95.0	75.6	32.7	9.9	1.6	0.1	458	10	4
Hungary	1.37	28.0	102.0	89.4	38.7	13.2	2.6	0.1	501	10	5
Poland	1.53	22.8	116.5	94.3	47.3	20.1	5.1	0.1	2 137	9	9
Republic of Moldova	1.76	31.7	134.4	102.7	54.2	23.6	4.9	0.4	290	10	9
Romania	1.17	36.3	97.3	60.6	26.0	10.5	3.0	0.2	1 036	15	5
Russian Federation	1.35	44.5	114.9	64.4	30.6	11.8	2.6	0.2	7 107	18	6
Slovakia	1.39	32.0	124.8	77.8	31.1	10.6	1.7	0.0	291	12	4
Ukraine	1.38	36.0	115.6	72.7	36.0	13.6	2.8	0.0	2 477	13	6
Northern Europe	1.69	23.9	75.0	110.9	86.9	34.9	6.1	0.3	5 507	6	13
Denmark	1.72	8.6	64.0	135.2	98.0	33.0	5.2	0.0	321	2	11
Estonia	1.29	38.3	103.3	68.6	30.6	13.4	2.8	0.0	64	16	7
Finland	1.73	9.6	62.6	123.1	100.3	42.1	8.0	0.4	293	3	16
Iceland	2.10	23.9	98.3	134.0	103.3	50.4	10.1	0.0	22	6	14
Ireland	1.90	19.2	55.9	107.5	124.8	59.0	13.0	0.8	261	6	18
Latvia	1.25	26.8	101.5	66.3	36.3	15.3	3.8	0.3	107	11	9
Lithuania	1.43	36.5	107.4	82.1	39.0	16.0	3.7	0.3	190	13	8
Norway	1.85	13.3	73.3	132.5	104.0	40.3	6.3	0.4	290	3	13
Sweden	1.57	7.2	57.1	112.7	91.4	38.3	6.9	0.3	454	2	15
United Kingdom	1.72	28.6	77.1	110.4	87.0	34.7	5.8	0.3	3 483	7	13
Southern Europe	1.31	14.1	55.9	89.2	69.8	27.3	5.3	0.4	7 142	5	12
Albania	2.50	33.6	145.3	167.0	96.9	43.3	12.6	1.4	324	7	10
Bosnia and Herzegovina	1.35	28.1	99.9	81.8	41.0	15.4	3.5	0.3	193	10	8
Croatia	1.56	19.3	99.7	106.9	59.7	21.7	4.3	0.3	237	6	9
Greece	1.28	12.7	60.9	94.0	60.5	23.2	4.2	0.5	491	5	11
Italy	1.20	7.2	39.8	83.1	73.3	30.6	5.7	0.3	2 587	2	15
Malta	1.89	11.6	77.2	144.8	96.6	38.8	8.7	0.3	25	3	14
Portugal	1.37	20.3	69.5	95.8	60.9	22.0	5.0	0.4	521	7	9
Slovenia	1.26	16.5	92.8	88.2	39.4	12.4	2.5	0.2	92	6	6
Spain	1.15	8.0	30.3	81.0	77.1	28.4	4.9	0.3	1 812	3	14

TABLE A.12 (*continued*)

Major area, region and country	Total fertility rate (per woman)	Age-specific fertility rate (per 1,000 women) 15-20	20-25	25-30	30-35	35-40	40-45	45-50	Births (thousands)	Percentage of births to women Under age 20	Aged 35 or over
The former Yugoslav Republic of Macedonia	2.06	42.1	162.3	133.1	53.6	17.2	3.3	0.3	157	11	5
Yugoslavia	1.84	38.6	133.2	112.6	55.2	21.7	5.9	0.7	684	11	8
Western Europe	1.48	9.6	61.7	108.2	80.9	30.1	5.1	0.3	9 647	3	13
Austria	1.41	17.5	75.5	100.1	62.0	22.7	4.0	0.2	417	5	10
Belgium	1.55	10.9	73.2	130.5	70.7	21.1	3.4	0.3	540	3	9
France	1.71	8.6	71.8	132.7	87.6	33.9	7.2	0.3	3 574	2	12
Germany	1.30	11.0	57.5	90.8	71.3	26.0	3.6	0.2	3 771	3	13
Luxembourg	1.67	11.7	69.1	125.3	91.9	31.4	4.3	0.3	26	3	12
Netherlands	1.50	4.2	33.6	96.3	115.2	44.1	6.3	0.3	907	1	17
Switzerland	1.47	3.8	42.5	104.0	99.8	37.6	5.9	0.2	404	1	16
Latin America and the Caribbean	2.69	75.5	152.9	138.6	94.2	54.1	19.8	3.8	57 768	16	11
Caribbean	2.55	74.2	138.1	130.9	88.6	53.1	19.9	4.3	3 882	16	12
Bahamas	2.60	68.6	135.7	133.6	108.2	57.2	14.0	2.6	33	13	13
Barbados	1.50	43.8	84.0	80.4	58.8	26.1	6.0	0.9	17	13	11
Cuba	1.55	65.4	98.7	82.2	45.0	15.9	2.4	0.4	726	17	5
Dominican Republic	2.80	88.7	165.3	143.6	90.8	49.9	16.8	4.9	984	18	9
Guadeloupe	1.90	29.3	87.0	115.1	88.2	46.4	13.3	0.8	37	7	14
Haiti	4.38	70.1	164.5	213.5	188.4	151.5	71.1	17.3	1 258	12	20
Jamaica	2.50	91.0	137.0	116.5	83.0	50.5	19.0	3.0	277	20	11
Martinique	1.75	27.3	79.5	106.1	83.3	42.7	10.5	0.7	29	7	14
Netherlands Antilles	2.20	35.2	107.4	140.8	95.9	47.1	12.3	1.3	18	8	16
Puerto Rico	2.11	70.4	132.9	117.3	68.3	27.0	5.5	0.4	326	17	7
Trinidad and Tobago	1.65	39.6	102.3	102.3	52.8	26.4	6.6	0.0	90	15	9
Central America	3.05	81.2	168.4	152.8	109.9	68.2	24.3	4.8	17 133	16	11
Belize	3.66	98.9	215.3	180.4	131.5	71.3	32.3	2.2	35	18	8
Costa Rica	2.83	84.6	157.7	139.9	101.4	59.8	19.8	2.0	442	18	12
El Salvador	3.17	95.2	174.1	151.3	105.5	69.0	30.8	8.1	828	19	10
Guatemala	4.93	119.3	249.7	233.0	189.0	128.2	55.0	11.2	1 954	18	12
Honduras	4.30	114.6	226.2	192.7	154.3	105.2	55.8	11.3	1 015	19	12
Mexico	2.75	69.5	154.0	142.3	100.0	60.8	19.6	3.8	11 692	15	10
Nicaragua	4.42	152.1	234.3	201.4	148.8	99.7	39.0	8.6	858	24	10
Panama	2.63	82.0	154.8	135.4	88.7	45.1	15.6	3.5	309	17	9
South America	2.58	73.2	147.9	133.7	89.3	49.5	18.4	3.4	36 753	17	11
Argentina	2.62	64.8	138.6	143.9	103.3	54.5	16.6	2.1	3 569	15	12
Bolivia	4.36	79.2	214.9	217.3	169.2	115.3	59.0	17.5	1 308	12	15
Brazil	2.27	71.9	138.0	119.0	73.4	37.0	12.5	2.2	16 721	18	9

TABLE A.12 (*continued*)

Major area, region and country	Total fertility rate (per woman)	Age-specific fertility rate (per 1,000 women) 15-20	20-25	25-30	30-35	35-40	40-45	45-50	Births (thousands)	Percentage of births to women Under age 20	Aged 35 or over
Chile	2.44	49.0	148.5	147.4	90.9	41.6	9.8	0.7	1 462	10	10
Colombia	2.80	87.6	163.1	136.9	92.1	54.9	21.8	4.0	4 950	18	11
Ecuador	3.10	71.9	156.9	149.2	115.7	78.4	38.3	9.7	1 545	15	14
Guyana	2.32	57.9	146.6	138.3	72.8	37.5	10.7	0.2	93	13	9
Paraguay	4.17	76.0	201.1	198.0	172.2	119.9	55.5	10.5	808	13	17
Peru	2.98	57.5	148.0	148.7	116.3	81.3	36.9	7.3	3 063	12	15
Suriname	2.21	22.0	99.3	170.2	96.4	44.2	9.5	0.0	42	6	9
Uruguay	2.40	70.1	123.5	130.2	95.1	46.5	13.1	0.7	289	16	11
Venezuela	2.98	98.2	167.9	145.1	101.4	58.2	21.3	4.6	2 861	20	11
Northern America	1.94	55.7	104.3	108.4	81.0	33.0	6.2	0.3	20 859	13	12
Canada	1.55	23.4	67.3	106.3	80.2	28.4	4.4	0.1	1 753	7	12
United States of America	1.99	59.2	108.6	108.7	81.2	33.6	6.4	0.3	19 100	14	12
Oceania	2.38	27.5	100.4	148.6	120.2	55.9	17.8	5.9	2 635	6	16
Australia/New Zealand	1.83	22.4	69.7	122.7	103.3	40.4	6.6	0.3	1 527	6	13
Australia	1.79	20.1	67.1	122.2	101.9	40.0	6.5	0.3	1 239	5	14
New Zealand	2.01	33.6	82.7	125.4	110.0	42.5	7.4	0.4	288	8	13
Melanesia	4.28	34.4	169.2	222.5	182.8	128.7	78.9	39.8	941	6	20
Fiji	2.73	48.4	165.5	164.2	96.5	51.6	16.9	2.9	87	12	10
New Caledonia	2.70	54.8	158.7	151.8	99.0	53.2	19.5	3.0	24	11	10
Papua New Guinea	4.60	23.5	161.8	231.4	202.4	150.5	98.8	51.5	729	4	23
Solomon Islands	4.85	93.9	236.8	251.5	188.2	126.1	55.9	17.6	73	14	13
Vanuatu	4.30	74.1	215.6	225.8	166.7	113.2	47.8	16.8	29	12	16
Micronesia	4.08	55.9	200.7	235.8	182.9	101.0	36.0	4.1	91	9	12
Guam	3.40	96.2	210.2	194.1	119.5	48.9	10.7	0.4	20	15	8
Polynesia	3.38	54.5	170.6	188.1	132.9	85.0	34.9	10.8	76	10	14
French Polynesia	2.85	68.4	171.7	158.6	102.5	54.2	13.2	1.4	26	13	10
Samoa	4.15	36.7	160.9	219.8	177.0	136.0	72.8	26.8	25	7	18

Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).
[a]Comprising all regions of Europe and Northern America, Australia/New Zealand and Japan.
[b]Comprising all regions of Africa, Asia (excluding Japan), Latin America and the Caribbean, and Melanesia, Micronesia and Polynesia.
[c]For statistical purposes, the data for China do not include Hong Kong Special Administrative Region (Hong Kong SAR).
[d]As of 1 July 1997, Hong Kong became a Special Administrative Region (SAR) of China.

TABLE A.13. TRENDS IN PERCENTAGE OF MARRIED WOMEN[a] USING CONTRACEPTION, MAJOR AREAS, REGIONS AND COUNTRIES

(Most recent survey data available)

Major area, region and country	Levels of current contraceptive use: Year	Age range	Percentage using: Any method	Modern[b] method	Trends: Time period	Annual increase in percentage using: Any method	Modern[b] method
Africa							
Eastern Africa							
Burundi	1987	15-49	9	1			
Comoros	1996	15-49	21	11			
Eritrea	1995	15-49	5[c]	4			
Ethiopia[d]	1990	15-49[e]	4	3			
Kenya	1993	15-49	33	27	1984-1993	1.7	1.9
Madagascar	1992	15-49	17	5			
Malawi	1996	15-49	22	14	1984-1996	1.2	1.1
Mauritius	1991	15-44	75	49	1985-1991	-0.8	0.1
Mozambique	1997	15-49	6[f]	5[f]			
Réunion	1990	15-49[g]	67	62			
Rwanda	1992	15-49	21	13	1983-1992	1.3	1.4
Uganda	1995	15-49	15	8	1988-1995	1.5	0.8
United Rep. of Tanzania	1996	15-49	18	13	1991-1996	1.7	1.4
Zambia	1996	15-49	25[c]	14	1992-1996	2.4	1.4
Zimbabwe	1994	15-49	48	42	1984-1994	1.0	1.6
Middle Africa							
Cameroon	1991	15-49	16	4	1978-1991	1.0	0.3
Central African Rep.	1994/95	15-49	15	3			
Dem. Rep. of the Congo	1991	12-49	8	2			
Northern Africa							
Algeria	1995	15-49[e]	52[c,h]	49[h]	1986-1995	1.9	2.0
Egypt	1995	15-49	47[c]	46	1984-1995	1.6	1.5
Libyan Arab Jamahiriya	1995	15-49	40[c,f]	26[f]			
Morocco	1995	15-49	50	42	1983-1995	2.2	1.9
Sudan (North)	1992/93	15-49	8[c]	7	1978-1993	0.3	0.2
Tunisia	1994	15-49	60[f]	51[f]	1983-1994	1.8	1.6
Southern Africa							
Botswana	1988	15-49	33	32	1984-1988	1.2	3.0
Lesotho	1991/92	15-49[i]	23[f]	19[f]	1977-1992	1.3[j]	1.2[j]
Namibia	1992	15-49	29	26			
South Africa	1988	< 50	50	48	1975-1988	1.0	1.1
Swaziland	1988	15-49[k]	20	17			
Western Africa							
Benin	1996	15-49	16[f]	3[f]	1981-1996	0.5	0.2
Burkina Faso	1993	15-49	8[l]	4			
Côte d'Ivoire	1994	15-49	11	4	1980-1994	0.6	0.3
Gambia	1990	15-49	12	7			
Ghana	1993	15-49	20	10	1979-1993	0.8	0.3
Guinea	1992/93	15-49	2	1			
Liberia	1986	15-49	6	6			
Mali	1995/96	15-49	7	5	1987-1996	0.2	0.4
Mauritania	1990	15-49	3[c]	1	1981-1990	0.3	0.1
Niger	1992	15-49	4	2			
Nigeria	1990	15-49	6	4	1981-1990	0.1	0.4
Senegal	1997	15-49	13[f]	8[f]	1986-1997	0.1	0.5
Togo	1988	15-49	12[l]	3			

TABLE A.13 (*continued*)

Major area, region and country	Levels of current contraceptive use: Year	Age range	Percentage using: Any method	Modern[b] method	Trends: Time period	Annual increase in percentage using: Any method	Modern[b] method
Asia							
Eastern Asia							
China	1992	15-49	83	83	1982-1992	1.3	1.5
Dem. People's Rep. of Korea	1990/92	15-49[m]	62	53			
Hong Kong	1992	15-49	86	80	1982-1992	1.4	1.6
Japan	1994	15-49	59	53[n]	1984-1994	0.1	0.2
Mongolia	1994	15-49[i]	61	25			
Republic of Korea	1991	15-44	79	70	1979-1991	2.0	2.2
South-central Asia							
Afghanistan	1972/73	15-44[e]	2	2			
Bangladesh	1996/97	10-49	49	42	1983-1997	2.3	2.1
Bhutan	1994	15-49[i]	19	19			
India	1992/93	13-49	41	36	1980-1993	0.5[j]	0.7[j]
Iran (Islamic Rep. of)	1992	15-44	65	45	1989-1992	5.2[j]	5.6[j]
Kazakhstan	1995	15-49	59	46			
Nepal	1996	15-49	29	26	1986-1996	1.4	1.2
Pakistan	1994/95	15-49	18	13	1984-1995	1.0	0.6
Sri Lanka[p]	1993	15-49	66	44	1982-1993	1.0	1.2
Uzbekistan	1996	15-49	56	51			
South-eastern Asia							
Indonesia	1994	15-49	55	52	1987-1994	1.0	1.2
Lao People's Dem. Rep.	1993	15-49[o]	19	15			
Malaysia (Peninsular)	1988	15-49	48	31	1974-1988	1.1	0.6
Myanmar	1992	15-49	17[f]	14[f]			
Philippines	1993	15-49	40	25	1983-1993	1.0	0.7
Singapore	1982	15-44	74	73	1973-1982	1.6	2.3
Thailand	1993	15-44	74	72	1984-1993	1.0	1.1
Viet Nam	1994	15-49	65	44	1988-1994	1.9	1.4
Western Asia							
Bahrain	1995	<50[q]	61[c,f]	30[f]	1989[j]-1995	1.1	0.0
Iraq	1989	15-49[q]	14[c]	10	1974-1989	-0.1	-0.2
Jordan[r]	1990	15-49	35	27	1976-1990	0.7	0.7
Kuwait	1987	<50[q]	35	32			
Lebanon	1971	15-49	53	23			
Oman	1995	<50[q]	22[c,f]	18[f]	1988[j]-1995	1.9	1.6
Qatar	1987	<50	32	29			
Syrian Arab Republic	1993	15-49	36[c,f]	28[f]	1978-1993	1.1	0.9
Turkey	1993	15-49	63[f]	35[f]	1983-1993	1.2	1.2
United Arab Emirates	1995	<50[q]	27[c,f]	44[f]			
Yemen	1997	15-49	13[c,f]	10[f]	1991-1997	0.9	0.6
Europe							
Eastern Europe							
Belarus	1995	18-34	50	42			
Bulgaria	1976	15-44[s]	76	8			
Czech Republic	1993	15-44	69	45			
Hungary	1992/93	18-41	73[f]	60[f]	1977-1993	0.0[j]	0.5[j]
Poland	1977	<45	75[h]	26[h]	1972-1977	3.0	2.6
Republic of Moldova	1997	15-44	74[f]	50[f]			
Romania	1993	15-44	57[f]	15[f]	1978-1993	0.0	0.6
Slovakia	1991	15-44[t]	74	41			
Northern Europe							
Denmark	1988	15-44[t]	78	72	1975-1988	1.2[j]	0.9[j]

TABLE A.13 (*continued*)

Major area, region and country	Levels of current contraceptive use: Year	Age range	Percentage using: Any method	Percentage using: Modern[b] method	Trends: Time period	Annual increase in percentage using: Any method	Annual increase in percentage using: Modern[b] method
Estonia	1994	20-49[l]	70	56			
Finland	1977	18-44[s]	80	78	1971-1977	0.5	4.0
Latvia	1995	18-49	48	39			
Lithuania	1994/95	18-49	59[f]	40[f,n]			
Norway	1988/89	[u]	74	69[n]	1977-1989	0.2[j]	0.4[j]
Sweden	1981	20-44[t]	78	71			
United Kingdom[v]	1993	16-49	82	82	1986-1993	0.1	0.6
Southern Europe							
Italy	1979	18-44[s]	78[w]	32[w]			
Portugal	1979/80	15-49	66	33			
Spain	1985	18-49	59	38	1977[p]-1985	1.1[j]	2.4[j]
Yugoslavia[x]	1976	<45	55[h]	12[h]	1970-1976	-0.7	0.3
Western Europe							
Austria	1981/82	[y]	71	56			
Belgium[z]	1991	20-40	79	75	1982-1991	-0.1	1.2
France	1994	20-44	75	69	1978-1994	-0.3	1.4
Germany	1992	20-39	75	72			
Netherlands	1993	18-42	79	76	1982-1993	0.1[j]	0.2[j]
Switzerland	1980	[aa]	71	65			
Latin America and the Caribbean							
Caribbean							
Antigua and Barbuda	1988	15-44[g]	53	51	1981-1988	2.0	2.0
Bahamas	1988	15-44[g]	62	60			
Barbados	1988	15-44[g]	55	53	1980-1988	1.0	1.0
Cuba	1987	15-49	70	67			
Dominica	1987	15-44[g]	50	48	1981-1987	0.1	0.2
Dominican Republic	1996	15-49	64	59	1980-1996	1.3	1.5
Grenada	1990	15-44[g]	54	..	1985-1990	4.7	..
Guadeloupe	1976	15-44[g]	44	31			
Haiti	1994/95	15-49[g]	18	13	1983-1995	1.0	0.8
Jamaica	1993	15-44[g]	62	58	1983-1993	1.0	0.9
Martinique	1976	15-44[g]	51	38			
Montserrat	1984	15-44[g]	53	52			
Puerto Rico	1982	15-49[e]	64	58	1968-1982	0.3	0.5
Saint Kitts and Nevis	1984	15-44[g]	41	37			
Saint Lucia	1988	15-44[g]	47	46	1981-1988	0.7	0.8
Saint Vincent and the Grenadines	1988	15-44[g]	58	55	1981-1988	2.4	2.2
Trinidad and Tobago	1987	15-49[g]	53	44	1977-1987	0.1	-0.1
Central America							
Belize	1991	15-44[g]	47	42			
Costa Rica	1992/93	15-49	75	65	1981-1993	0.8	0.7
El Salvador	1993	15-44	53	48	1985-1993	0.6[j]	0.4[j]
Guatemala	1995	15-44	31	27	1983-1995	0.5	0.5
Honduras	1996	15-44	50	41	1981-1996	1.5	1.1
Mexico	1995	15-49	67	58	1987-1995	1.7	1.6
Nicaragua	1992	15-49	49	45	1981-1992	1.9	1.9
Panama	1984	15-44	58[ab]	54	1976-1984	0.5	0.9
South America							
Bolivia	1994	15-49	45	18	1983-1994	1.8	0.5
Brazil	1996	15-49	77	70	1986-1996	1.1	1.4
Colombia	1995	15-49	72	59	1986-1995	0.9	0.8
Ecuador	1994	15-49	57	46	1982-1994	1.4	1.1

TABLE A.13 (*continued*)

Major area, region and country	Levels of current contraceptive use: Year	Age range	Percentage using: Any method	Modern[b] method	Trends: Time period	Annual increase in percentage using: Any method	Modern[b] method
Guyana	1975	15-49[g]	31	28			
Paraguay	1995/96	15-49	56	41	1987-1996	1.3	1.5
Peru	1996	15-49	64	41	1981-1996	1.6	1.6
Venezuela	1977	15-44	49	38			
Northern America							
Canada	1995	15-49	75[f]	75[f]	1984-1995	0.2	0.4
United States of America	1990	15-44	71	67	1982-1990	0.3	0.6
Oceania							
Australia/New Zealand							
Australia	1986	20-49	76	72			
New Zealand	1995	20-49	75[f,i]	72[f]	1976-1995	0.3[j]	0.5[j]
Melanesia							
Fiji	1974	15-49	41	35			
Papua New Guinea	1996	15-49	26	20			

NOTES: This table shows the most recent data available as of 30 June 1998. Two dots (..) indicate that data are not available.

Information about contraceptive use is taken mainly from representative sample surveys of women of reproductive age. Data pertain to married couples, including where possible those in consensual unions. World and regional average levels of current contraceptive use were derived based on survey data shown and assumptions about patterns of use in countries for which no information was available.

[a]Including consensual unions, where possible.

[b]Modern or clinic and supply methods include male and female sterilization, the intrauterine device (IUD), the pill, injectables, hormonal implants, condoms and female barrier methods.

[c]Adjusted from source to exclude breastfeeding.

[d]Excluding Eritrea, Tigray, Aseb, Ogaden, parts of Gondar and Welo, and nomadic population.

[e]Ever-married women.

[f]Preliminary or provisional.

[g]Including visiting unions.

[h]Excluding sterilization.

[i]For all women of ages specified.

[j]Trend may be affected by differences in the base population or geographical coverage at the two dates.

[k]Including never-married women who have a child.

[l]Excluding prolonged abstinence: 17 per cent in Burkina Faso; 22 per cent in Togo.

[m]Not clear from source whether sample is nationally representative.

[n]Some women reported more than one method; figure shown assumes that modern methods were not used in combination with other modern methods.

[o]Not a nationally representative sample; national prevalence level is probably lower than indicated.

[p]Excluding areas containing roughly 15 per cent of the population.

[q]Households of nationals of the country.

[r]Excluding the West Bank.

[s]Women in first marriage.

[t]All sexually active women.

[u]Women currently married or cohabiting who were born in 1945, 1950, 1955, 1960, 1965 or 1968.

[v]Data pertaining to Great Britain.

[w]Use since last pregnancy (since marriage, if no pregnancy).

[x]Former Socialist Federal Republic of Yugoslavia.

[y]Marriage cohorts of 1974 and 1977.

[z]Flemish population.

[aa]Sample of husbands and wives married between 1970 and 1979.

[ab]Excluding douche, abstinence and folk methods.

TABLE A.14. TRENDS IN LIFE EXPECTANCY, MAJOR AREAS, REGIONS AND COUNTRIES, 1970-2000

Major area, region and country	Life expectancy at birth (years) 1970-1975 Male	Female	Both sexes	1995-2000 Male	Female	Both sexes	Change (in years) 1970-1975 to 1995-2000 Male	Female	Both sexes
World	56.5	59.4	58.0	63.2	67.6	65.4	6.8	8.2	7.4
More developed regions[a]	67.6	74.7	71.2	71.1	78.7	74.9	3.5	4.0	3.7
Less developed regions[b]	53.9	55.5	54.7	61.8	65.0	63.3	7.8	9.6	8.6
Least developed countries	42.9	44.5	43.7	49.6	51.5	50.5	6.7	6.9	6.8
Africa	44.5	47.7	46.1	50.0	52.8	51.4	5.5	5.1	5.3
Eastern Africa	43.3	46.5	44.9	44.4	46.4	45.4	1.2	0.0	0.6
Burundi	42.4	45.6	44.0	41.0	43.8	42.4	-1.4	-1.9	-1.6
Comoros	47.0	51.0	48.9	57.4	60.2	58.8	10.4	9.2	9.9
Djibouti	39.5	42.6	41.0	48.7	52.0	50.4	9.3	9.4	9.3
Eritrea	42.8	45.9	44.3	49.3	52.4	50.8	6.5	6.4	6.5
Ethiopia	39.5	42.6	41.0	42.4	44.3	43.3	2.9	1.7	2.3
Kenya	49.0	53.0	51.0	51.1	53.0	52.0	2.1	0.0	1.1
Madagascar	45.0	48.0	46.5	56.0	59.0	57.5	11.0	11.0	11.0
Malawi	40.3	41.7	41.0	38.9	39.6	39.3	-1.4	-2.1	-1.7
Mauritius	60.7	65.3	62.9	67.9	75.1	71.4	7.2	9.7	8.4
Mozambique	40.9	44.1	42.5	43.9	46.6	45.2	2.9	2.5	2.7
Réunion	60.4	68.1	64.2	70.9	79.8	75.4	10.4	11.7	11.2
Rwanda	43.0	46.2	44.6	39.4	41.7	40.5	-3.7	-4.6	-4.1
Somalia	39.5	42.6	41.0	45.4	48.6	47.0	6.0	6.0	6.0
Uganda	44.9	48.1	46.5	38.9	40.4	39.6	-6.0	-7.7	-6.8
United Republic of Tanzania	44.9	48.2	46.5	46.8	49.1	47.9	1.9	0.9	1.4
Zambia	45.7	49.0	47.3	39.5	40.6	40.1	-6.2	-8.3	-7.2
Zimbabwe	49.8	53.3	51.5	43.6	44.7	44.1	-6.2	-8.6	-7.4
Middle Africa	42.2	45.6	43.9	48.6	51.7	50.1	6.3	6.1	6.2
Angola	36.5	39.5	38.0	44.9	48.1	46.5	8.4	8.6	8.5
Cameroon	44.3	47.3	45.8	53.4	56.0	54.7	9.1	8.7	9.0
Central African Republic	40.5	45.6	43.0	42.9	46.9	44.9	2.5	1.3	1.9
Chad	37.5	40.6	39.0	45.7	48.7	47.2	8.2	8.1	8.2
Congo	44.1	49.3	46.7	46.3	50.8	48.6	2.2	1.5	1.9
Dem. Republic of the Congo	44.4	47.6	46.1	49.2	52.3	50.8	4.8	4.7	4.7
Equatorial Guinea	39.0	42.1	40.5	48.4	51.6	50.0	9.5	9.6	9.5
Gabon	43.4	46.6	45.0	51.1	53.8	52.4	7.7	7.2	7.4
Northern Africa	49.9	52.5	51.2	63.3	66.4	64.8	13.4	13.8	13.6
Algeria	53.5	55.5	54.5	67.5	70.3	68.9	14.0	14.8	14.4
Egypt	50.8	53.4	52.1	64.7	67.9	66.3	13.9	14.4	14.2
Libyan Arab Jamahiriya	51.4	54.5	52.9	68.3	72.2	70.0	16.9	17.7	17.0
Morocco	51.4	54.5	52.9	64.8	68.5	66.6	13.4	14.0	13.7
Sudan	42.3	45.1	43.7	53.6	56.4	55.0	11.3	11.3	11.3
Tunisia	55.1	56.1	55.6	68.4	70.7	69.5	13.3	14.6	13.9
Western Sahara	41.9	45.1	43.5	59.8	63.1	61.4	17.8	18.0	17.9
Southern Africa	50.4	55.8	53.0	51.5	57.5	54.4	1.0	1.7	1.4
Botswana	51.5	55.0	53.2	46.2	48.4	47.4	-5.3	-6.6	-5.8
Lesotho	47.5	51.5	49.5	54.7	57.3	56.0	7.2	5.8	6.5
Namibia	47.5	50.0	48.7	51.8	53.0	52.4	4.3	3.0	3.7
South Africa	51.0	56.5	53.6	51.5	58.1	54.7	0.5	1.6	1.1
Swaziland	45.1	49.6	47.3	57.9	62.5	60.2	12.8	12.9	12.9
Western Africa	41.6	44.7	43.1	48.6	51.3	49.9	7.0	6.7	6.8
Benin	42.3	45.8	44.0	51.7	55.2	53.4	9.4	9.4	9.4
Burkina Faso	39.7	42.2	40.9	43.6	45.2	44.4	3.9	3.0	3.4
Cape Verde	56.0	59.0	57.5	65.5	71.3	68.9	9.5	12.3	11.5
Côte d'Ivoire	43.9	47.1	45.4	46.2	47.3	46.7	2.3	0.2	1.3
Gambia	35.5	38.6	37.0	45.4	48.6	47.0	9.9	10.1	10.0
Ghana	48.4	51.7	50.0	58.3	61.8	60.0	9.9	10.1	10.0

TABLE A.14 (*continued*)

Major area, region and country	Life expectancy at birth (years) 1970-1975 Male	Female	Both sexes	1995-2000 Male	Female	Both sexes	Change (in years), 1970-1975 to 1995-2000 Male	Female	Both sexes
Guinea	36.8	37.8	37.3	46.0	47.0	46.5	9.2	9.2	9.2
Guinea-Bissau	35.0	38.1	36.5	43.5	46.5	45.0	8.5	8.4	8.5
Liberia	46.0	49.0	47.5	46.1	48.5	47.3	0.1	-0.5	-0.2
Mali	41.9	43.8	42.9	52.0	54.6	53.3	10.1	10.7	10.4
Mauritania	41.9	45.1	43.5	51.9	55.1	53.5	10.0	10.0	10.0
Niger	37.5	40.6	39.0	46.9	50.1	48.5	9.4	9.6	9.5
Nigeria	41.9	45.1	43.5	48.7	51.5	50.1	6.8	6.4	6.6
Senegal	39.3	44.3	41.8	50.5	54.2	52.3	11.2	9.9	10.5
Sierra Leone	33.5	36.5	35.0	35.8	38.7	37.2	2.3	2.2	2.2
Togo	43.9	47.1	45.5	47.6	50.1	48.8	3.7	3.0	3.3
Asia	55.9	56.8	56.3	64.8	67.9	66.3	8.9	11.1	10.0
Eastern Asia	63.1	65.2	64.2	68.8	73.4	71.0	5.7	8.2	6.8
China[c]	62.5	63.9	63.2	67.9	72.0	69.8	5.4	8.1	6.6
China, Hong Kong SAR[d]	68.5	75.6	72.0	75.8	81.4	78.5	7.3	5.8	6.5
Dem. People's Rep. of Korea	59.2	64.0	61.8	68.9	75.1	72.2	9.7	11.1	10.4
Japan	70.6	76.2	73.3	76.8	82.9	80.0	6.2	6.7	6.7
Macau	64.0	69.0	66.4	75.1	80.1	77.7	11.1	11.1	11.2
Mongolia	52.5	55.0	53.8	64.4	67.3	65.8	11.9	12.3	12.1
Republic of Korea	59.3	66.1	62.6	68.8	76.0	72.4	9.5	9.9	9.8
South-central Asia	50.8	49.6	50.2	61.8	62.9	62.3	10.9	13.3	12.1
Afghanistan	38.0	38.0	38.0	45.0	46.0	45.5	7.0	8.0	7.5
Bangladesh	45.6	44.1	44.9	58.1	58.2	58.1	12.5	14.1	13.3
Bhutan	42.5	44.0	43.2	59.5	62.0	60.7	17.0	18.0	17.5
India	51.2	49.3	50.3	62.3	62.9	62.6	11.1	13.6	12.3
Iran (Islamic Republic of)	56.2	55.5	55.9	68.5	70.0	69.2	12.3	14.5	13.4
Kazakhstan	59.2	69.4	64.4	62.8	72.5	67.6	3.6	3.1	3.2
Kyrgyzstan	58.8	67.3	63.1	63.3	71.9	67.6	4.6	4.7	4.5
Maldives	52.7	50.1	51.4	65.7	63.3	64.5	13.0	13.2	13.1
Nepal	44.0	42.5	43.3	57.6	57.1	57.3	13.6	14.6	14.1
Pakistan	50.6	50.5	50.6	62.9	65.1	64.0	12.3	14.6	13.4
Sri Lanka	64.0	66.0	65.0	70.9	75.4	73.1	6.9	9.4	8.1
Tajikistan	60.8	65.9	63.4	64.2	70.2	67.2	3.4	4.3	3.8
Turkmenistan	57.2	64.1	60.7	61.9	68.9	65.4	4.7	4.8	4.7
Uzbekistan	60.7	67.4	64.2	64.3	70.7	67.5	3.7	3.3	3.4
South-eastern Asia	50.3	53.5	51.9	63.7	67.8	65.7	13.4	14.3	13.8
Brunei Darussalam	66.9	69.9	68.3	73.4	78.1	75.5	6.5	8.2	7.2
Cambodia	39.0	41.7	40.3	51.5	55.0	53.4	12.5	13.3	13.0
East Timor	39.2	40.7	40.0	46.7	48.4	47.5	7.4	7.7	7.5
Indonesia	48.0	50.5	49.3	63.3	67.0	65.1	15.3	16.5	15.9
Lao People's Dem. Republic	39.1	41.8	40.4	52.0	54.5	53.2	12.9	12.7	12.8
Malaysia	61.4	64.7	63.0	69.9	74.3	72.0	8.5	9.6	9.0
Myanmar	48.3	51.4	49.8	58.5	61.8	60.1	10.2	10.4	10.3
Philippines	56.4	59.4	57.8	66.5	70.2	68.3	10.1	10.8	10.5
Singapore	67.4	71.8	69.5	74.9	79.3	77.1	7.6	7.5	7.6
Thailand	57.7	61.6	59.6	65.8	72.0	68.8	8.1	10.4	9.2
Viet Nam	47.7	53.1	50.3	64.9	69.6	67.4	17.2	16.5	17.1
Western Asia	56.1	59.9	57.9	65.9	70.2	68.0	9.8	10.4	10.1
Armenia	69.3	75.3	72.5	67.2	73.6	70.5	-2.1	-1.7	-2.0
Azerbaijan	64.9	72.5	69.0	65.5	74.1	69.9	0.6	1.6	0.9
Bahrain	61.7	65.4	63.5	71.1	75.3	72.9	9.4	9.9	9.4
Cyprus	70.0	72.9	71.4	75.5	80.0	77.8	5.5	7.1	6.3
Gaza Strip	54.9	58.3	56.6	69.3	73.3	71.3	14.4	15.0	14.8

TABLE A.14 (*continued*)

Major area, region and country	Life expectancy at birth (years) 1970-1975 Male	Female	Both sexes	1995-2000 Male	Female	Both sexes	Change (in years), 1970-1975 to 1995-2000 Male	Female	Both sexes
Georgia	65.0	72.9	69.2	68.5	76.8	72.7	3.5	3.8	3.5
Iraq	56.1	57.9	57.0	60.9	63.9	62.4	4.8	6.0	5.4
Israel	70.1	73.3	71.6	75.7	79.7	77.8	5.6	6.4	6.1
Jordan	54.9	58.3	56.6	68.9	71.5	70.1	14.0	13.2	13.6
Kuwait	65.3	69.3	67.3	74.1	78.2	75.9	8.8	8.9	8.7
Lebanon	63.1	67.0	65.0	68.1	71.7	69.9	5.0	4.7	4.9
Oman	47.8	50.2	49.0	68.9	73.3	70.9	21.1	23.1	21.9
Qatar	60.7	64.4	62.6	70.0	75.4	71.7	9.3	11.0	9.2
Saudi Arabia	52.4	55.5	53.9	69.9	73.4	71.4	17.5	17.9	17.5
Syrian Arab Republic	55.4	58.7	57.0	66.7	71.2	68.9	11.3	12.5	11.9
Turkey	55.9	60.0	57.9	66.5	71.7	69.0	10.6	11.7	11.1
United Arab Emirates	60.7	64.4	62.5	73.9	76.5	74.8	13.2	12.1	12.3
Yemen	41.9	42.4	42.1	57.4	58.4	58.0	15.5	16.0	15.9
Europe	67.2	74.2	70.8	69.2	77.4	73.3	2.0	3.2	2.5
Eastern Europe	64.8	73.4	69.5	63.3	73.8	68.5	-1.5	0.4	-0.9
Belarus	66.6	75.5	71.5	62.2	73.9	68.0	-4.4	-1.6	-3.5
Bulgaria	68.7	73.9	71.2	67.6	74.7	71.1	-1.1	0.8	-0.2
Czech Republic	66.7	73.5	70.0	70.3	77.4	73.9	3.7	3.9	3.8
Hungary	66.5	72.4	69.3	66.8	74.9	70.9	0.3	2.6	1.5
Poland	67.0	74.1	70.5	68.2	76.9	72.5	1.2	2.8	2.1
Republic of Moldova	61.6	68.5	64.8	63.5	71.5	67.5	1.9	3.0	2.7
Romania	66.8	71.3	69.0	66.2	73.9	69.9	-0.6	2.6	1.0
Russian Federation	63.1	73.5	68.2	60.6	72.8	66.6	-2.5	-0.7	-1.6
Slovakia	66.8	73.5	70.0	69.2	76.7	73.0	2.4	3.3	2.9
Ukraine	65.3	74.0	70.1	63.8	73.7	68.8	-1.6	-0.3	-1.3
Northern Europe	69.2	75.5	72.4	73.5	79.5	76.5	4.4	4.0	4.2
Denmark	70.9	76.4	73.6	73.0	78.3	75.7	2.1	1.9	2.1
Estonia	65.7	74.6	70.5	63.0	74.5	68.7	-2.7	-0.1	-1.8
Finland	66.6	75.0	70.7	73.0	80.6	76.8	6.3	5.6	6.1
Iceland	71.4	77.4	74.3	76.8	81.3	79.0	5.4	3.9	4.7
Ireland	68.9	73.8	71.3	73.6	79.2	76.3	4.7	5.4	5.1
Latvia	65.3	74.5	70.1	62.5	74.4	68.4	-2.9	-0.2	-1.7
Lithuania	67.0	75.4	71.3	64.3	75.6	69.9	-2.7	0.2	-1.4
Norway	71.4	77.6	74.4	75.2	81.1	78.1	3.8	3.5	3.7
Sweden	72.1	77.5	74.7	76.3	80.8	78.5	4.2	3.3	3.8
United Kingdom	69.0	75.2	72.0	74.5	79.8	77.2	5.5	4.6	5.2
Southern Europe	68.7	74.2	71.4	73.7	80.1	76.9	5.0	6.0	5.5
Albania	66.0	69.5	67.7	69.9	75.9	72.8	3.9	6.3	5.1
Bosnia and Herzegovina	65.2	69.5	67.5	70.5	75.9	73.3	5.3	6.4	5.8
Croatia	66.2	72.9	69.6	68.8	76.5	72.6	2.6	3.6	3.0
Greece	70.6	74.2	72.3	75.6	80.7	78.1	5.0	6.5	5.8
Italy	69.2	75.2	72.1	75.0	81.2	78.2	5.8	6.0	6.1
Malta	68.5	72.8	70.6	74.9	79.3	77.2	6.4	6.5	6.6
Portugal	64.9	71.3	68.0	71.8	78.8	75.3	6.9	7.5	7.3
Slovenia	66.0	73.5	69.8	70.6	78.2	74.4	4.6	4.7	4.6
Spain	70.2	75.7	72.9	74.5	81.5	78.0	4.3	5.8	5.1
The former Yugoslav Republic of Macedonia	66.1	68.9	67.5	70.9	75.3	73.1	4.8	6.4	5.6
Yugoslavia	66.8	70.6	68.8	70.2	75.5	72.8	3.4	4.9	4.1

TABLE A.14 (*continued*)

Major area, region and country	Life expectancy at birth (years) 1970-1975 Male	Female	Both sexes	1995-2000 Male	Female	Both sexes	Change (in years), 1970-1975 to 1995-2000 Male	Female	Both sexes
Western Europe	68.4	74.9	71.7	74.1	80.8	77.6	5.7	5.9	5.8
Austria	67.0	74.3	70.6	73.7	80.2	77.0	6.7	5.9	6.5
Belgium	68.2	74.7	71.4	73.8	80.6	77.2	5.6	5.9	5.8
France	68.6	76.3	72.4	74.2	82.0	78.1	5.6	5.7	5.8
Germany	67.9	73.8	71.0	73.9	80.2	77.2	6.0	6.4	6.2
Luxembourg	67.2	74.4	70.7	73.3	79.9	76.7	6.1	5.5	6.0
Netherlands	71.1	77.0	74.0	75.0	80.7	77.9	3.9	3.7	4.0
Switzerland	70.8	77.0	73.8	75.4	81.8	78.6	4.6	4.8	4.8
Latin America and the Caribbean	58.6	63.3	60.9	66.1	72.6	69.2	7.4	9.2	8.3
Caribbean	61.4	64.9	63.1	66.3	71.0	68.6	4.9	6.1	5.5
Bahamas	63.2	69.9	66.6	70.5	77.1	73.8	7.3	7.2	7.3
Barbados	66.9	72.0	69.4	73.7	78.7	76.4	6.8	6.7	7.0
Cuba	69.4	72.7	70.7	74.2	78.0	75.7	4.8	5.3	5.0
Dominican Republic	58.1	61.8	59.8	69.0	73.1	70.6	10.8	11.3	10.8
Guadeloupe	64.7	70.9	67.8	73.6	80.9	77.3	8.9	10.0	9.5
Haiti	47.1	50.0	48.5	51.4	56.2	53.7	4.3	6.2	5.3
Jamaica	67.3	70.7	69.0	72.9	76.8	74.8	5.6	6.0	5.8
Martinique	66.3	72.0	69.2	75.5	82.0	78.8	9.2	10.0	9.7
Netherlands Antilles	67.8	73.0	70.4	72.5	78.4	75.5	4.7	5.4	5.1
Puerto Rico	69.2	76.0	72.2	69.4	78.5	73.9	0.2	2.5	1.8
Trinidad and Tobago	63.6	68.3	65.9	71.5	76.2	73.8	7.9	7.9	7.9
Central America	58.8	63.4	61.1	68.4	74.0	71.2	9.5	10.6	10.1
Belize	66.9	68.3	67.6	73.4	76.1	74.7	6.5	7.8	7.1
Costa Rica	66.1	70.2	67.9	74.3	78.9	76.0	8.2	8.7	8.1
El Salvador	56.1	60.6	58.2	66.5	72.5	69.1	10.4	11.9	10.9
Guatemala	52.4	55.4	53.7	61.4	67.2	64.0	9.0	11.8	10.3
Honduras	52.1	56.2	53.9	67.5	72.3	69.4	15.4	16.1	15.5
Mexico	60.1	65.2	62.4	69.5	75.5	72.2	9.4	10.3	9.8
Nicaragua	53.7	56.8	55.1	65.8	70.6	67.9	12.1	13.8	12.7
Panama	65.0	68.0	66.2	71.8	76.4	73.6	6.8	8.3	7.4
South America	58.1	63.1	60.6	65.3	72.3	68.7	7.1	9.1	8.1
Argentina	64.1	70.8	67.1	69.7	76.8	72.9	5.6	6.0	5.8
Bolivia	44.6	49.0	46.7	59.8	63.2	61.4	15.2	14.2	14.7
Brazil	57.6	62.2	59.6	63.1	71.0	66.8	5.5	8.8	7.1
Chile	60.5	66.8	63.4	72.3	78.3	74.9	11.8	11.5	11.5
Colombia	59.7	63.9	61.6	67.3	74.3	70.4	7.5	10.4	8.8
Ecuador	57.4	60.5	58.8	67.3	72.5	69.5	10.0	12.0	10.7
Guyana	58.0	62.1	60.0	61.1	67.9	64.4	3.1	5.8	4.4
Paraguay	63.8	68.1	65.9	67.5	72.0	69.6	3.7	3.9	3.7
Peru	53.9	57.3	55.5	65.9	70.9	68.3	12.0	13.6	12.8
Suriname	61.7	66.5	64.0	67.5	72.7	70.1	5.8	6.2	6.1
Uruguay	65.6	72.2	68.7	70.5	78.0	73.9	4.8	5.8	5.3
Venezuela	63.3	68.9	65.7	70.0	75.7	72.4	6.6	6.8	6.7
Northern America	67.7	75.4	71.5	73.6	80.2	76.9	5.9	4.8	5.4
Canada	69.7	76.8	73.2	76.1	81.8	79.0	6.4	5.0	5.8
United States of America	67.5	75.3	71.3	73.4	80.1	76.7	5.8	4.8	5.4
Oceania	64.1	69.3	66.6	71.4	76.3	73.8	7.3	7.0	7.2
Australia/New Zealand	68.5	75.1	71.7	75.2	80.9	78.0	6.8	5.7	6.4
Australia	68.4	75.2	71.7	75.5	81.1	78.2	7.1	5.9	6.5
New Zealand	68.7	74.8	71.7	74.1	79.7	76.9	5.4	4.9	5.2

TABLE A.14 (*continued*)

Major area, region and country	Life expectancy at birth (years) 1970-1975 Male	Female	Both sexes	1995-2000 Male	Female	Both sexes	Change (in years), 1970-1975 to 1995-2000 Male	Female	Both sexes
Melanesia	50.5	51.3	50.8	59.9	62.2	61.0	9.4	10.9	10.2
Fiji	63.6	66.7	65.1	70.6	74.9	72.7	7.0	8.2	7.6
New Caledonia	61.0	67.0	63.9	69.2	76.3	72.5	8.2	9.3	8.6
Papua New Guinea	47.7	47.6	47.7	57.2	58.7	57.9	9.5	11.1	10.2
Solomon Islands	60.2	63.9	62.0	69.7	73.9	71.7	9.5	10.0	9.7
Vanuatu	52.4	55.7	54.0	65.5	69.5	67.4	13.1	13.9	13.4
Micronesia	57.5	61.5	59.4	67.6	71.4	69.4	10.0	9.9	10.0
Guam	65.7	73.3	69.4	73.0	77.4	75.0	7.2	4.1	5.6
Polynesia	58.0	61.3	59.5	69.3	74.1	71.6	11.3	12.9	12.0
French Polynesia	59.3	63.0	60.9	69.3	74.6	71.7	10.0	11.6	10.9
Samoa	57.0	60.0	58.5	69.3	73.6	71.3	12.3	13.6	12.9

Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).
[a]Comprising all regions of Europe and Northern America, Australia/New Zealand and Japan.
[b]Comprising all regions of Africa, Asia (excluding Japan), Latin America and the Caribbean, and Melanesia, Micronesia and Polynesia.
[c]For statistical purposes, the data for China do not include Hong Kong Special Administrative Region (Hong Kong SAR).
[d]As of 1 July 1997, Hong Kong became a Special Administrative Region (SAR) of China.

TABLE A.15. TRENDS IN INFANT MORTALITY, MAJOR AREAS, REGIONS AND COUNTRIES, 1995-2000

Major area, region and country	Infant mortality rate (per 1,000 births) 1970-1975	1995-2000	Annual percentage change, 1970-1975 to 1995-2000
World	93	57	-2.4
More developed regions[a]	21	9	-4.1
Less developed regions[b]	104	63	-2.5
Least developed countries	146	99	-1.9
Africa	131	87	-2.1
Eastern Africa	136	101	-1.5
Burundi	137	119	-0.7
Comoros	127	76	-2.6
Djibouti	154	106	-1.9
Eritrea	129	91	-1.7
Ethiopia	154	115	-1.4
Kenya	98	66	-2.0
Madagascar	150	82	-3.0
Malawi	191	138	-1.6
Mauritius	55	15	-6.4
Mozambique	168	114	-1.9
Réunion	41	9	-7.7
Rwanda	142	124	-0.7
Somalia	155	122	-1.2
Uganda	116	107	-0.4
United Republic of Tanzania	125	81	-2.1
Zambia	100	82	-1.0
Zimbabwe	93	69	-1.5
Middle Africa	135	95	-1.8
Angola	173	125	-1.6
Cameroon	119	74	-2.4
Central African Republic	132	98	-1.5
Chad	166	112	-2.0
Congo	95	90	-0.3
Dem. Republic of the Congo	127	90	-1.7
Equatorial Guinea	158	108	-1.9
Gabon	132	87	-2.1
Northern Africa	132	52	-4.7
Algeria	132	44	-5.5
Egypt	150	51	-5.4
Libyan Arab Jamahiriya	117	28	-7.2
Morocco	122	51	-4.4
Sudan	110	71	-2.2
Tunisia	120	30	-6.9
Western Sahara	140	64	-3.9
Southern Africa	83	62	-1.5
Botswana	88	58	-2.1
Lesotho	130	93	-1.7
Namibia	113	65	-2.8
South Africa	77	59	-1.3
Swaziland	133	65	-3.6
Western Africa	133	90	-2.0
Benin	137	88	-2.2
Burkina Faso	137	99	-1.6
Cape Verde	91	56	-2.5
Côte d'Ivoire	129	87	-2.0
Gambia	179	122	-1.9
Ghana	108	66	-2.5

TABLE A.15 (*continued*)

Major area, region and country	Infant mortality rate (per 1,000 births) 1970-1975	1995-2000	Annual percentage change, 1970-1975 to 1995-2000
Guinea	177	124	-1.8
Guinea-Bissau	183	130	-1.7
Liberia	182	116	-2.2
Mali	203	118	-2.7
Mauritania	142	92	-2.2
Niger	167	115	-1.9
Nigeria	117	81	-1.8
Senegal	122	63	-3.3
Sierra Leone	193	170	-0.6
Togo	129	84	-2.2
Asia	98	57	-2.7
Eastern Asia	56	38	-2.0
China[c]	61	41	-2.0
China, Hong Kong SAR[d]	17	6	-5.5
Dem. People's Rep. of Korea	50	22	-4.2
Japan	12	4	-4.9
Macau	43	10	-7.4
Mongolia	98	51	-3.3
Republic of Korea	38	10	-6.7
South-central Asia	132	73	-3.0
Afghanistan	194	151	-1.2
Bangladesh	140	79	-2.9
Bhutan	142	63	-4.1
India	132	72	-3.0
Iran (Islamic Republic of)	122	35	-6.2
Kazakhstan	50	35	-1.8
Kyrgyzstan	59	40	-1.9
Maldives	121	50	-4.4
Nepal	160	83	-3.3
Pakistan	140	74	-3.2
Sri Lanka	56	18	-5.8
Tajikistan	74	57	-1.3
Turkmenistan	78	55	-1.8
Uzbekistan	63	44	-1.8
South-eastern Asia	101	46	-3.9
Brunei Darussalam	54	10	-8.6
Cambodia	181	103	-2.8
East Timor	183	135	-1.5
Indonesia	114	48	-4.3
Lao People's Dem. Republic	145	93	-2.2
Malaysia	42	11	-6.6
Myanmar	122	79	-2.2
Philippines	71	35	-3.5
Singapore	19	5	-6.7
Thailand	65	29	-4.1
Viet Nam	106	38	-5.1
Western Asia	111	51	-3.9
Armenia	22	26	0.8
Azerbaijan	41	36	-0.6
Bahrain	52	16	-5.8
Cyprus	29	8	-6.1
Gaza Strip	82	24	-6.1
Georgia	35	19	-2.9

TABLE A.15 (*continued*)

Major area, region and country	Infant mortality rate (per 1,000 births) 1970-1975	1995-2000	Annual percentage change, 1970-1975 to 1995-2000
Iraq	96	95	0.0
Israel	23	8	-5.2
Jordan	82	26	-5.7
Kuwait	43	12	-6.3
Lebanon	48	29	-2.5
Oman	145	25	-8.8
Qatar	57	17	-6.0
Saudi Arabia	105	23	-7.6
Syrian Arab Republic	88	33	-4.9
Turkey	138	45	-5.6
United Arab Emirates	57	16	-6.3
Yemen	184	80	-4.2
Europe	25	12	-3.8
Eastern Europe	28	18	-2.3
Belarus	21	23	0.3
Bulgaria	26	17	-2.0
Czech Republic	20	6	-5.6
Hungary	34	10	-6.0
Poland	27	15	-2.9
Republic of Moldova	46	29	-2.4
Romania	40	23	-2.8
Russian Federation	28	18	-2.2
Slovakia	24	11	-4.0
Ukraine	22	19	-0.7
Northern Europe	16	8	-3.9
Denmark	12	7	-2.7
Estonia	21	19	-0.5
Finland	12	6	-3.6
Iceland	12	5	-4.0
Ireland	18	7	-4.6
Latvia	21	18	-0.8
Lithuania	22	21	-0.4
Norway	12	5	-4.3
Sweden	10	5	-3.2
United Kingdom	17	7	-4.6
Southern Europe	31	10	-5.7
Albania	58	30	-3.3
Bosnia and Herzegovina	51	15	-6.0
Croatia	27	10	-4.9
Greece	34	8	-7.3
Italy	26	7	-6.6
Malta	22	8	-4.9
Portugal	45	9	-8.1
Slovenia	22	7	-6.0
Spain	21	7	-5.9
The former Yugoslav Republic of Macedonia	74	23	-5.8
Yugoslavia	47	18	-4.8
Western Europe	18	6	-5.6
Austria	24	6	-6.8
Belgium	19	7	-4.9
France	16	6	-4.6
Germany	21	5	-7.0
Luxembourg	16	7	-4.1

TABLE A.15 (*continued*)

Major area, region and country	Infant mortality rate (per 1,000 births) 1970-1975	1995-2000	Annual percentage change, 1970-1975 to 1995-2000
Netherlands	12	6	-3.5
Switzerland	13	6	-4.3
Latin America and the Caribbean	81	36	-4.1
Caribbean	77	36	-3.7
Bahamas	33	15	-3.8
Barbados	33	12	-4.9
Cuba	38	9	-7.2
Dominican Republic	94	34	-5.1
Guadeloupe	42	9	-8.0
Haiti	152	68	-4.0
Jamaica	45	22	-3.6
Martinique	35	7	-7.8
Netherlands Antilles	28	14	-3.4
Puerto Rico	25	12	-3.7
Trinidad and Tobago	41	15	-5.2
Central America	75	33	-4.1
Belize	52	29	-2.9
Costa Rica	53	12	-7.3
El Salvador	105	32	-5.9
Guatemala	102	46	-4.0
Honduras	104	35	-5.4
Mexico	69	31	-4.0
Nicaragua	98	43	-4.1
Panama	43	21	-3.5
South America	84	37	-4.1
Argentina	48	22	-4.0
Bolivia	151	66	-4.2
Brazil	91	42	-3.8
Chile	69	13	-8.4
Colombia	73	30	-4.5
Ecuador	95	46	-3.7
Guyana	79	58	-1.6
Paraguay	53	39	-1.5
Peru	110	45	-4.5
Suriname	49	29	-2.6
Uruguay	46	18	-4.9
Venezuela	49	21	-4.2
Northern America	18	7	-4.7
Canada	16	6	-5.0
United States of America	18	7	-4.7
Oceania	41	24	-2.7
Australia/New Zealand	17	6	-5.2
Australia	17	6	-5.4
New Zealand	16	7	-4.3
Melanesia	89	53	-2.6
Fiji	45	20	-4.1
New Caledonia	45	11	-7.3
Papua New Guinea	100	61	-2.4

TABLE A.15 (*continued*)

Major area, region and country	Infant mortality rate (per 1,000 births) 1970-1975	1995-2000	Annual percentage change, 1970-1975 to 1995-2000
Solomon Islands	61	23	-4.9
Vanuatu	99	39	-4.7
Micronesia	73	34	-3.7
Guam	21	10	-3.7
Polynesia	84	17	-8.1
French Polynesia	64	11	-8.8
Samoa	99	23	-7.4

Source: *World Population Prospects: The 1998 Revision*, vol. I, *Comprehensive Tables* (United Nations publication, Sales No. E.99.XIII.9).
[a]Comprising all regions of Europe and Northern America, Australia/New Zealand and Japan.
[b]Comprising all regions of Africa, Asia (excluding Japan), Latin America and the Caribbean, and Melanesia, Micronesia and Polynesia.
[c]For statistical purposes, the data for China do not include Hong Kong Special Administrative Region (Hong Kong SAR).
[d]As of 1 July 1997, Hong Kong became a Special Administrative Region (SAR) of China.

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Litho in United Nations, New York
99-35711—December 2000—6,655
ISBN 92-1-151342-1

United Nations publication
Sales No. E.00.XIII.4
ST/ESA/SER.A/183