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DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
POPULATION DIVISION

WORLD POPULATION MONITORING 1998

HEALTH AND MORTALITY: SELECTED ASPECTS

United Nations • New York, 2000

NOTE

The designations employed and the presentation of material in the present report do not imply the expression of any opinion on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

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

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

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PREFACE

The present report has been prepared in response to Economic and Social Council resolution 1995/55 of 28 July 1995, in which the Council endorsed the terms of reference and the topic-oriented and prioritized multi-year work programme proposed by the Commission on Population and Development at its twenty-eight session.[1] According to the multi-year work programme, which was to serve as a framework for the assessment of the progress achieved in the implementation of the Programme of Action of the International Conference on Population and Development,[2] a new series of reports on a special set of the themes would be prepared annually. The theme selected for 1998, "Health and mortality", is the topic of this report.

This report provides recent information on selected aspects of health and mortality and covers such topics as primary health care and the health care sector; levels and trends of mortality; child survival and health; women's health and safe motherhood; human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS); the epidemiological transition; health and mortality policies; and health and development. The report centres on issues covered in chapter VIII (Health, morbidity and mortality) of the Programme of Action. However, as pointed out by the Commission on Population and Development, other issues are also relevant to this issue, namely those covered in chapters IV (Gender equality, equity and empowerment of women); V (The family, its roles, rights, composition and structure); VI (Population growth and structure); and XII (Technology, research and development).

This 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, and fertility and mortality levels in countries, major areas and regions. These annex tables also provide data specific to health and mortality.

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 the various United Nations offices, regional commissions and specialized agencies that helped directly or indirectly in its preparation. In particular, chapters I and IV were prepared by the World Health Organization (WHO) and chapter V was prepared by the Joint and Co-sponsored United Nations Programme on HIV/AIDS (UNAIDS). Chapter III includes a contribution from the United Nations Children's Fund (UNICEF). Acknowledgement is also due to Irma Elo of University of Pennsylvania for her contribution to chapter VI on the epidemioligical transition.

NOTES

[1] *Official Records of the Economic and Social Council, 1995, Supplement No. 7* (E/1995/27), annexes I and II.

[2] *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.

SOURCES, METHODS AND CLASSIFICATIONS

Global and regional data on demographic trends used in the present report are taken from the 1996 revision of the official United Nations publication of estimates and projections, World Population Prospects: The 1996 Revision.[1] Country data are taken from the same report, national sources or various United Nations sources, as appropriate. 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, 1995,[2] and updates; and from Results of the Seventh United Nations Population Inquiry among Governments.[3]

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 1950-1995. For the period 1995-2050, figures are mostly the result of projections from the year 1995, except in such cases where reliable more recent data are available.

The countries and areas, that are identified as statistical units by the Statistics Division of the Department of Economic and Social Affairs of the United Nations Secretariat 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 divided, 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, and Oceania (excluding Australia and New Zealand). The more developed regions include all other regions plus the three countries excluded from the less developed regions. Other regional groupings are used, as appropriate to the subject matter.

NOTES

[1]United Nations publication, Sales No. E.98.XIII.5.
[2]United Nations publication, Sales No. E.96.XIII.8.
[3]United Nations publication, Sales No. E.95.XII.11.

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Explanatory notes

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

Various symbols have been used in the tables throughout this report as follows:

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

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

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

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

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

A slash (/) indicates a crop year or financial year, for example, 1994/95.

Use of a hyphen (-) between years, for example, 1994-1995, signifies the full period involved, including the beginning and end years.

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

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

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, the Central African Republic, Chad, the Comoros, the Democratic Republic of the Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, the Gambia, Guinea, Guinea-Bissau, Haiti, Kiribati, the Lao People's Democratic Republic, Lesotho, Liberia, Madagascar, Malawi, Maldives, Mali, Mauritania, Mozambique, Myanmar, Nepal, the Niger, Rwanda, Samoa, Sao Tome and Principe, Sierra Leone, Solomon Islands, Somalia, the Sudan, Togo, Tuvalu, Uganda, the United Republic of Tanzania, Vanuatu, Yemen and Zambia.

The following abbreviations have been used:

ACC	Administrative Committee on Coordination
AIDS	acquired immunodeficiency syndrome
ARI	acute respiratory infection
BCG	Bacillus Calmette-Guérin, anti-tuberculosis vaccine
BFHI	Baby-Friendly Hospital Initiative
BSSA	Basic Social Services for All
CMV	cytomegalovirus
CSDR	child survival and development revolution
DAC	Development Assistance Committee (OECD)
DHS	Demographic and Health Surveys
DOTS	directly observed treatment, short course
DPT	diphtheria, pertussis (whooping cough), tetanus
EDC	essential drugs concept
EPI	Expanded Programme on Immunization
GDP	gross domestic product
GNP	gross national product
HDP	hypertensive disorders of pregnancy
HIV	human immunodeficiency virus
HRH	Human Resources for Health
ICD	International Classification of Diseases
IDD	iodine deficiency disorders
IDU	injecting drug user
IMCI	Integrated Management of Childhood Illness
MAC	mycobacterium avium complex disease
NID	national immunization day
ODA	official development assistance
OECD	Organisation for Economic Cooperation and Development
ORS	oral rehydration salts
ORT	oral rehydration therapy
PCP	pneumocystis carinii pneumonia
PID	pelvic inflammatory disease
SIV	simian immunodeficiency virus
STD	sexually transmitted disease
TASO	The AIDS Support Organization
TB	tuberculosis
TBA	traditional birth attendant
TTI	transfusion - transmittable infections
UCI	universal child immunization
UNAIDS	Joint and Co-sponsored United Nations Programme on HIV/AIDS
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
VAD	vitamin A deficiency
WHO	World Health Organization
ZDV	zidovudine

OVERVIEW

Since the Second World War, remarkable progress has been achieved in the reduction of mortality. In the period 1990-1995, for example, the global average life expectancy at birth is estimated to have been 64.3 years, a level typical for the more developed regions in the early 1950s. Life expectancy has risen more rapidly in the less developed regions than in the more developed regions, so that the gap between the two has narrowed considerably, from 25.6 years in the early 1950s to 12.1 years in 1990-1995. In 1990-1995, life expectancy is estimated to have been 74.2 years in the more developed regions and 62.1 years in the less developed regions.

Among the more developed regions, Southern Europe has achieved the fastest mortality decline, recording a gain of 12.7 years in four decades and reaching a life expectancy at birth of 76.0 years in 1990-1995. Mortality has continued to decline in the more developed regions, even at very low levels of mortality. Reductions of mortality in adult ages, and especially in advanced ages, have made a major contribution to rising life expectancies.

Mortality trends in the countries with economies in transition have been different, however, from those in the countries with established market economies. From the post-World War period to the mid-1960s, life expectancy in the former Union of Soviet Socialist Republics (USSR) and most Eastern European countries was rising steadily, approaching levels in Northern America and Western Europe. Life expectancy then stagnated for two to three decades, interrupted by short-lived rises and reversals. The stagnation was the result of two opposing trends: slowly improving child survival and deteriorating survival of adults, especially males. As a result, the average life expectancy within Eastern Europe varied in 1990-1995 from 66.5 in the Russian Federation to 72.0 in the Czech Republic, whereas within the European Union it ranged from 74.4 years in Portugal to 78.1 years in Sweden.

Progress in the less developed regions has been uneven and current levels of life expectancy vary widely. Asia achieved the largest absolute gain in life expectancy between 1950-1955 and 1990-1995, with the figure increasing from 41.3 to 64.5 years. In Latin America and the Caribbean, where mortality levels were lower in the early 1950s, life expectancy increased less rapidly than in Asia, reaching 68.5 years in 1990-1995. Africa continued to lag further behind the other less developed regions, with an increase from 37.8 years in 1950-1955 to 51.8 years in 1990-1995. The impact of the human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) epidemic has been particularly devastating in parts of Africa and has caused stagnation or decline in life expectancies.

The average life expectancy for the least developed countries increased from 35.5 years in 1950-1955 to 49.7 in 1990-1995. Progress has been slower than in the other developing countries and, as a result, the least developed countries fell further behind the rest of the world. While in 1950-1955 the average life expectancy in the group of least developed countries had been 6.2 years lower than the average for the less developed regions with that group excluded, by 1990-1995 the gap had widened to 14.6 years.

In 1990-1995, about 11 million children died annually before reaching age 5 and 8.2 million of them did not reach their first birthday. The vast majority of those deaths (98 per cent) occurred in developing countries, with the least developed countries accounting for a third of all deaths under age 5. In the developed world, only 11 out of every 1,000 newborn children died before they attained age 1 over the period 1990-1995; in the developing world the number of deaths was 68 per 1,000 live births. Infants in the least developed countries fared even worse, with 109 out of every 1,000 newly born dying before age 1. Similarly, mortality under age 5, a more sensitive indicator than infant mortality of socio-economic, environmental and behavioural factors, was 7 times higher in developing countries, and 12 times higher in least developed countries, than in developed countries.

Although it is estimated that infant and child mortality has declined consistently in all developing regions since 1970, the evidence suggests that the pace of decline may have begun to slow down during the 1980s, particularly among least developed countries. For many of the latter, the slowdown of the decline in mortality in childhood is associated with the growing prevalence of HIV infection.

It should be noted, however, that there are many developing countries where improvements in child survival over the past 20 years have been impressive. Those countries include some of the most populous in the world, such as China, India and Mexico. There are also a few developing countries that have reached infant mortality levels comparable with those of developed countries.

A declining trend in infant mortality has also tended to characterize the countries with economies in transition. Estimates since 1990 show annual fluctuations that sometimes imply an increase from one year to the next, but the overall trend is downward. The developed countries with established market economies continue to exhibit very low levels of infant mortality. The lowest level has been recorded by Sweden: 3 deaths per 1,000 in 1996.

Primary health care has contributed significantly to the gains in health status. Nevertheless, following the 1978 Alma-Ata Declaration on Primary Health Care (World Health Organization, 1978), a long period elapsed before human and financial resources began to be reoriented towards primary health care. Decision-making in the health sector still favours curative clinical medicine over preventive and promotive public health. Public-health systems and services are under-resourced; and care for vulnerable groups, for the disabled and for the aged is on the whole poorly supported.

Many countries have expanded their drug regulatory capacity using norms and standards. Still, drug quality remains a concern, with substandard and counterfeit drugs becoming common in international commerce. The scarcity of human and financial resources, exacerbated by government cutbacks, undermines the ability of drug regulatory authorities to ensure that drugs on the market are safe, effective and of acceptable quality.

While there has been an overall increase in the provision of clean water and sanitation, it has been inadequate to cope with population increases in many countries. It is estimated that in 1994, 75 per cent of the population in developing countries had access to safe water supplies and 34 per cent to sanitation coverage. In regard to both forms of coverage, the rural population is worse off. In 1994, sanitation coverage in rural areas was a mere 18 per cent whereas it was 63 per cent in urban areas. Similarly, access to safe water amounted to 70 per cent in rural areas but to 82 per cent in urban areas.

Complications related to pregnancy and childbirth are among the leading causes of mortality for women of reproductive age in many parts of the developing world. Estimates of maternal mortality issued in 1996 indicate that about 585,000 women die each year of pregnancy-related causes, 99 per cent of them in developing countries. The gap in maternal mortality ratios between more developed and less developed regions is wide: in 1990, there were from more than 480 per 100,000 live births in the less developed regions compared with about 27 per 100,000 live births in the more developed regions. In parts of Africa, the ratio can be as high as 1,000 per 100,000 live births.

The causes of maternal deaths are similar around the world. Globally, about 80 per cent of such deaths are due to direct causes, that is to say, obstetric complications of the pregnant state from interventions, from omissions, from incorrect treatment or from a chain of events resulting from any of the above. The most common cause of death is obstetric haemorrhage. About 20 per cent of maternal deaths are due to indirect causes, that is to say, they are the result of existing disease aggravated by physiological effects of pregnancy. Of these indirect causes of death, one of the most significant is anaemia.

The most important proximate determinant of maternal health and survival is the extent to which women have access to and utilize high-quality maternal health care services. Current global estimates show that in the developing world approximately 65 per cent of pregnant women receive at least some care during pregnancy; 40 per cent of deliveries take place in health facilities; and slightly more than half of all deliveries are assisted by skilled personnel. This contrasts sharply with developed countries where practically every woman receives regular care during pregnancy, delivery and the post-partum period.

Over 30 million people worldwide were estimated to be living with HIV or AIDS at the end of 1997, about 1.1 million of whom were children. More than 90 per cent of cases are to be found in developing countries. An estimated 5.8 million new HIV infections occurred during 1997, at an average rate of about 16,000 per day. Of these new infections, about 40 per cent were in women, and about 10 per cent were in children. HIV disproportionately affects young adults: in 1997, over a half of newly infected adults were under age 25. HIV-related disease caused the death of some 2.3 million people in 1997 — about one fifth of all those who have died since the beginning of the pandemic. About 460,000 of these 2.3 million people were children.

While HIV infection is not presently curable, its course can be delayed significantly with combination antiretroviral therapy. In addition, there is a range of treatments available to prevent and treat the opportunistic infections and malignancies that affect people whose immune system has been weakened by the virus. The major problem in very many countries, however, is one of accessibility, given the overwhelming lack of availability and/or affordability of most forms of treatment.

As the overwhelming proportion of HIV infection occurs through sexual acts or injecting of drugs, behaviour change is a prime response in seeking to prevent transmission. Given the vulnerability of young people to HIV and other sexually transmitted diseases, educating children on AIDS while they are at school is an effective investment in their future.

The epidemiological transition — the shift from the predominance of infectious and parasitic diseases to that of chronic and degenerative diseases of adulthood as the main causes of death — is now under way in all regions of the world. Already by mid-century, non-communicable diseases, most notably circulatory diseases and cancer, had replaced infectious diseases as the most prevalent causes of death in developed countries. By the early 1990s, close to 90 per cent of all deaths in these areas were due to such causes.

Chronic and degenerative diseases are also emerging as the cause of an increasing proportion of all deaths in developing countries. As global child survival strategies have succeeded in reducing infant and child mortality from communicable diseases, the cause-of-death profiles in developing countries are changing. The fact that declines in fertility have in turn led to a shift in the population age structure towards an older population, has also contributed to the increase in the proportion of all deaths due to chronic and degenerative diseases of adulthood, even as adult death rates continue to decline. A larger proportion of the population is dying at older ages, where non-communicable diseases dominate the cause of death structure.

Despite the considerable progress made in increasing life expectancy worldwide, in reality there is no "acceptable" level of mortality, and no Government considers the levels of mortality in a country to be fully satisfactory. However, Governments characterize levels of mortality as acceptable, given the level of medical technology and the resources available for reducing mortality. As of 1995, 73 countries worldwide viewed their mortality levels to be acceptable and 107 countries considered them to be unacceptable. Not surprisingly, 86 per cent of the countries that regarded their mortality levels as unacceptable were developing countries.

The level of mortality achieved in a country influences not only government perceptions but also the types of health concerns expressed by the Government. In the developing countries, infant and child survival and maternal mortality are the principal concerns of Governments. In the more developed regions, the level of mortality of adult men as a whole or adult men in specific age groups was one of the major concerns. High and/or increasing mortality among adult men was viewed as an issue of particular concern by the countries of Eastern Europe.

Since the 1960s, the concept of development has evolved from a narrowly focused economic viewpoint towards one stressing the social aspects and environmental sustainability of development. The quest to better integrate economic and social factors into development has given impetus to a strategy emphasizing health, family planning, nutrition, education, safe drinking water, sanitation, shelter, poverty eradication and sustainable economic growth.

Income is an important health determinant, as it allows greater access to food, housing and health care. It is clear, however, that health depends on more than income. Despite constraints imposed by low income, some developing countries have achieved low mortality, showing that health can be achievable when political commitment is translated into wide access to basic health services, education and food.

In recent years, focus has shifted from examining the long-term impact of economic changes on health towards assessing the consequences of shorter-term macroeconomic fluctuations. In the 1980s, a severe economic downturn in some developing countries led to the imposition of structural adjustment programmes. There has been a concern that these programmes could have contributed to an erosion of health conditions, as countries pared government expenditures. Given that few tools exist to gauge the impact of adjustment on health, it is difficult to establish a link between cause and effect. It may be unrealistic, however, to expect an immediate impact on mortality; one may appear in subsequent mortality trends.

Among developed market economies, the potential detrimental impact of prolonged economic downturn on morbidity and mortality has been examined. With the persistence of high unemployment in Europe, research has looked at the impact of protracted unemployment on mortality. The data have not confirmed an association between unemployment and premature death. However, unemployment does appear to have a detrimental impact on mental health.

A key intersection of health and development concerns has been the environment. Safe drinking water, sanitation, pollution, deforestation, desertification, depletion of the ozone layer and climatic change are major determinants of health. Least developed countries are most at risk from traditional health hazards, including lack of safe water and sanitation, poor housing and shelter, unsafe food and high prevalence of disease vectors. Developing countries undergoing rapid industrialization are at risk from traditional as well as modern hazards such as pollution, hazardous waste, unsafe pesticides and other chemicals, workplace hazards and traffic accidents. A further threat is the potentially deleterious impact of global climate changes, including changes in the distribution of infectious and vector-borne diseases due to temperature changes. Poor environmental quality is linked to diarrhoeal diseases, respiratory infections and a variety of parasitic diseases, as well as cardiovascular diseases and cancer.

Recent decades have witnessed momentous changes in health and development. As a result, a new perspective has emerged that positions health at the heart of development. Health and low mortality are not merely intermediate objectives or milestones on the path to socio-economic development. Indeed, good health and long life are increasingly recognized as being goals in themselves as well as belonging among the fundamental pillars of development.

I. PRIMARY HEALTH CARE AND THE HEALTH-CARE SECTOR*

The primary health care movement was born from the recognition that there were serious gaps in access to health care and that activities in the health sector were not producing the desired or expected outcomes. The movement was effectively launched through the Alma-Ata Declaration on Primary Health Care of 1978 (World Health Organization, 1978) (see box 1). Commitment to its principles were reaffirmed in 1994 at the International Conference on Population and Development, when the participating Governments also subscribed to the declared objectives of the Conference in the area of primary health care and the health-care sector. These were "to increase the accessibility, availability, acceptability and affordability of health-care services and facilities to all people in accordance with national commitments to provide access to basic health care for all" and "to increase the healthy lifespan and improve the quality of life of all people, and to reduce disparities in life expectancy between and within countries." (United Nations, 1995, chap. I, resolution 1, annex, para. 8.3). Although many of the initiatives in health care considered here were started before the Conference, that meeting gave them a much-needed impetus.

BOX 1. PRIMARY HEALTH CARE

The International Conference on Primary Health Care, held in Alma-Ata in 1978, issued the Declaration of Alma-Ata, which stated that primary health care was the key to attaining health for all. It included the following definition:

"Primary health care is essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination. It forms an integral part both of the country's health system, of which it is the central function and main focus, and of the overall social and economic development of the community. It is the first level of contact of individuals, the family and community with the national health system bringing health-care as close as possible to where people live and work, and constitutes the first element of a continuing health care process."

The Declaration of Alma-Ata also defined the essential elements of primary health care as follows:

"...education concerning prevailing health problems and the methods of preventing and controlling them: promotion of food supply and proper nutrition; an adequate supply of safe water and basic sanitation; maternal and child health care, including family planning; immunization against the major infectious diseases; prevention and control of locally endemic diseases; appropriate treatment of common diseases and injuries; and provision of essential drugs."

Source: World Health Organization, *Primary Health Care* (Geneva, 1978).

*Prepared by the World Health Organization, Geneva.

The world has seen tremendous gains in health in the past 50 years. Those gains have been due not only to advances in science, technology and medicine, but also to expanded infrastructures, rising incomes and improved nutrition, sanitation, literacy and opportunities for women. It is difficult, however, to demonstrate a direct cause-and-effect relationship between basic health-care services (barring a few exceptions such as immunization programmes and perinatal care services) and reductions in morbidity and mortality because of the multifactorial nature of the problem and the lack of data.

Moreover, gains are often offset by new challenges. Increased life expectancy and the ageing of populations are being followed by a rise in non-communicable diseases in all countries. The developing world faces a double burden, since non-communicable diseases are increasingly adding their toll to that taken by communicable ones. Furthermore, to the challenge of long-standing tropical diseases must be added the problem posed by re-emerging diseases and the threat of human immunodeficiency virus/acquired immunodefiency syndrome (HIV/AIDS).

Between and within countries, certain health gaps have widened. Current trends in a number of diseases (such as the re-emergence of malaria and tuberculosis) raise the possibility that the health gains that have been achieved for many will not be sustained. Particularly in developing countries and countries with economies in transition, health has suffered most where economies have been unable to secure adequate income levels for all, where social systems have deteriorated and where environmental resources have been poorly managed.

A host of global and local environmental and social problems continue to add to the burden of disease and ill health. Poverty is a major cause of undernutrition and ill health. Indeed, the inequities and increasing gaps between rich and poor in many countries and communities, even as economic growth continues, threaten social cohesion and are strongly related to excess mortality, violence and psychological and social stress (World Health Organization, 1997a, pp. 6-7).

A. Allocation of resources to primary health care services

Primary health care has contributed significantly to the gains in health status. Nevertheless, following the 1978 Alma-Ata Declaration, a long period elapsed before human and financial resources began to be reoriented towards primary health care. Decision-making in the health sector still favours curative clinical medicine over preventive and promotive public health. Public-health systems and services are under-resourced, and care for vulnerable groups, for the disabled and for the aged is on the whole poorly supported (World Health Organization, 1997a, p. 10).

It has been a long-standing target for many developed countries to allocate 0.7 per cent of their gross national product (GNP) to development in the poorer countries. However, for the Development Assistance Committee (DAC)[1] as a whole, official development assistance (ODA) disbursements are now only 0.3 per cent of GNP. Moreover, a growing proportion of available ODA resources have been devoted to humanitarian needs and debt relief in recent years, placing an even greater strain on aid budgets (Organisation for Economic Cooperation and Development, 1996, p. 96).

According to the DAC report for 1996, education remains the largest single sector for assistance, accounting for 16-18 per cent of DAC members' sector-allocatable bilateral aid. Other social sectors have increased in importance. For example, assistance to water supply and sanitation accounted for 2 per cent of such aid in the late 1970s but this figure rose to around 8 per cent in the 1980s, which were designated as the International Drinking Water Supply and Sanitation Decade. Expenditure continues at around this level today. Assistance to population programmes has averaged about 2 per cent of total bilateral sector aid in recent years. The figure was slightly over 2 per cent in 1994 and is expected to rise further following the International Conference on Population and Development held in that year.

The only social sector where spending has not increased in recent years is health. Bilateral health assistance peaked at almost 9 per cent of members' sector aid in the years following the 1978 Alma-Ata Conference. Yet although the absolute amount of health assistance has remained at about US$ 1.5 billion for new projects each year, this figure now represents for 5-6 per cent of bilateral sector official development aid (Organisation for Economic Coopertion and Development, 1996).

Governments of the developing countries generally spend a small proportion of their gross domestic product (GDP) on health. For many low-income countries, the costs of financing a minimal package of cost-effective public-health and clinical services to be provided to the entire population would exceed current levels of government spending for health, even if resources were allocated and managed efficiently (World Bank, 1993). The average percentage of GDP devoted to health in all developing countries in 1990 was 2.0 per cent, and the average for the least developed countries was lower, estimated at 1.8 per cent (United Nations Development Programme, 1996). In at least six countries (the Democratic Republic of Congo, Indonesia, Morocco, Somalia, the Sudan and the Syrian Arab Republic), spending on health in 1990 was below 1 per cent of GDP.

Private spending has the potential to fill this gap. At present, spending by individuals and households represents a substantial share of total spending in poor countries, accounting for an average of 44 per cent of total health spending in sub-Saharan Africa and 78 per cent in India, including foreign assistance, or about 50 per cent and 80 per cent respectively, if such assistance is excluded (Bennett and Ngalande-Banda, 1994; World Bank, 1993).

Expenditures still tend to reflect the favouring of hospitals in the capital city rather than a more equitable distribution of resources at the local level to meet the priority needs of the whole population. While the percentage of national health expenditure devoted to local health services has been increasing in the industrialized countries, it has been stagnant in developing countries, and has decreased in the least developed countries (World Health Organization, 1993).

Another important resource allocation issue is the division between staff and other costs. With few exceptions, a large portion of health budgets in Africa — 80 per cent or more — goes to salaries, leaving little money for drugs and operating costs. The tendency in Africa and in Latin America has been to set up costly institutions, medical schools and hospitals along the lines of those in the Western world. The costs of first-level care in Africa are twice those in Asia, and the costs of hospital care are five times greater (Tarimo and Webster, 1997, p. 9).

As regards human resources, while developed market economies have an estimated 750 nurses and midwives per 100,000 population and the economies in transition report an estimated 800, the least developed countries have only 20 per 100,000. On the positive side, the global demand for nursing and midwifery services is on the rise, and all regions of WHO are reporting increased demand for support to training of nurses and the development of human resources (World Health Organization, 1997b).

There is still a strong bias in many countries in favour of placing the central responsibility of patient care on physicians even though experience shows that nurses and other health workers can ably provide many of the same services just as well. More effort is needed to monitor the productivity of the health labour force, the quality of services offered and the cost.

The introduction of market economies in some areas of the world has increased the migration of health professionals away from the public sector, where incentives tend to be low, and towards private practice. Public health and primary care are still not able to compete with clinical specialization. There is a need to correct imbalances in the distribution of health professionals between urban and rural areas, and imbalances in the composition of professional health categories. There is also a need to address not only education needs for all categories of health professionals but also issues relating to employment and working conditions.

A number of countries, such as Bangladesh, Guinea-Bissau, Kyrgyzstan, Turkmenistan and Uganda, are now developing more comprehensive Human Resources for Health (HRH) plans as part of their health sector reform activities. Countries such as Egypt are actively engaged in initiatives to reorient medical education and practice so as to meet national health goals. The need for a well-educated and trained and sufficiently large nursing and midwifery workforce is becoming widely acknowledged. Strategies to bring this about are faltering, however, in part to fiscal shortfalls and to the defence of narrow interests by physician lobby groups. On the other hand, however, some countries report that the numbers of doctors and other health workers have increased; although this may constitute progress it does not in itself improve service delivery.

B. Access to basic health care

Women suffer a disproportionate burden of ill health, which cannot be explained by biological differences alone. Women's social, economic and political disadvantages have a detrimental effect on their health. Gender disparity in turn plays its part in the poverty-sickness relationship. In developing countries, there are still 60 per cent more women than men among illiterate adults, yet programmes promoting the education of women and girls have been shown to have very high yields in health status. Even as few as one to three years of schooling have been associated with increased use of prenatal care, appropriate obstetric delivery services and immunization, and better hygiene and nutrition, as well as increased access to income. Sustained improvements in women's education appear to have been important components of success in reducing social inequalities in health in China, Costa Rica, India (the Kerala region) and Sri Lanka (World Health Organization, 1996a, p. 27).

In the field of immunization, during 1995 alone and in addition to the over 500 million routine immunization contacts with children under age 1, a record 300 million children — almost half of the world's children under age 5 — were immunized during mass campaigns against poliomyelitis (World Health Organization/United Nations Children's Fund, 1996a, p. 29). These immunization contacts also opened up opportunities for other primary health care interventions, including health education for mothers, vitamin and mineral supplements for children who needed them, and routine health checks.

National Governments everywhere must take primary responsibility for ensuring equity in health status and access to essential health care in the twenty-first century. This is the only way in which accountability to citizens can be adequately ensured in an epoch when health systems and services will involve a multitude of actors — private actors, non-governmental organizations and public actors; when the policies and practices of other sectors of the economy will continue to create both risks and opportunities for improving health; when market forces will continue to create a dilemma with regard to resource allocation choices; and when decentralized authority, on the one hand, and supranational forces, on the other, can offer no guarantee of equity (World Health Organization, 1997c).

WHO launched an initiative in 1996 aimed at addressing the broad issue of equity in health and health care (World Health Organization, 1996a). The initiative in particular seeks to ensure that people's needs, rather than their social privileges, guide the distribution of opportunities for well-being, and to reduce avoidable gaps in health status and health services between men and women and between groups with different levels of social privilege.

C. Community participation in health planning

Although some progress has been made, the current situation in a great many countries is one where the health-care services often remain inaccessible to vulnerable groups, are fragmented, are of poor quality and do not meet the expectations of the public. They are underfunded, and what scarce resources are available are inefficiently used. Moreover, hospitals still use between one half and three quarters of the total national expenditure for the health sector (Barnum and Kutzin, 1993). Essential public-health functions to promote health and prevent illness or protect the population from health hazards in the biological and behavioural environments have been widely neglected.

Health policy planners still largely ignore the felt or expressed needs of people at the grass-roots level. Community participation is often one of the declared aims of decentralizing public-health administration to lower levels of the ministry of health. A growing number of initiatives and a variety of methods have been used to establish structures that will facilitate community involvement in local-level planning. In practice, these structures have had little input at local or at district level. Overall, this aspect of decentralization has probably achieved the least change in regard to the participation of all. A potentially more productive initiative, one which is intended to empower entire rural communities to take responsibility for their own health, is the move to create Healthy Villages, particularly in the Asian and Eastern Mediterranean regions (World Health Organization, 1997d).

Interventions to address the the problems of the elderly, of the disabled and of persons with HIV/AIDS are more effective at the community level. Similarly, the promotion of breastfeeding, advice on reproductive health, and education for mothers on infant and child care have a more direct impact when they come from known persons within each community than when they seem to have been imposed by a central bureaucracy.

Active community participation, in terms of the planning and management of health activities, is still uncommon. For many countries in Africa, for instance, outside donor agencies have funded most health development activities in recent years, and they require tangible results in a short time if they are to continue to fund projects. The tendency, therefore, has been to see community self-reliance as secondary to activities that the agencies feel can yield immediate results. There are often reactionary forces within communities themselves that try to maintain existing power structures, for example, even in the context of selecting village health workers, and this too — added to the sometimes paternalistic attitude of health professionals — makes community participation difficult (Tarimo and Webster, 1997, p. 21).

D. Training of health-care personnel

Many countries are fully cognizant of the principles of scientific education, but this is sometimes emphasized at the expense of clinical skills and competence. More attention needs to be paid to the evaluation of such skills, as well as to the monitoring and evaluation of performance. Better management of human resources is not merely a matter of training greater numbers of health workers or rearranging the training curricula. What is essential is to provide the right incentives so as to attract young people into health work, as well as adequate pay and career structures which will ensure that they stay in it rather than drift away towards more rewarding jobs in industry. Specific issues that need to be addressed are the gender inequalities that are still rife in the health labour force, and the still too limited scope of practice of nurses.

One neglected area of training concerns programmes of continuing education which, while often talked about, tend not to be put into practice. Yet the pace of change in medicine today demands that curricula at all levels be constantly revised and updated. It is to be hoped that communications technology will help to reduce the professional and social isolation of staff assigned to difficult-to-access areas, and will prove a potential tool for continuing education and improved service delivery.

Better delegation of responsibilities within the health-care delivery system will require adjustments to each country's health budget. Less spending on hospitals and more on primary care are an obvious first step; but a well-functioning primary care system will also need budgetary provision for the secondary and tertiary levels to ensure that the referral process works smoothly.

Many developing countries use the public-health institutes of developed countries, particularly the United States of America, as models. However, such institutions often focus on theoretical knowledge to the detriment of field application, and this kind of training may be inappropriate for developing countries. A number of initiatives are being undertaken in developing countries to correct these deficiencies, such as the creation of a network to link the various types of primary health care training and health development centres, including public-health schools. Such arrangements are more likely to meet the public health leadership requirements at the national and intermediate levels (Tarimo and Webster, 1997, p. 72).

E. Access to essential drugs

Access to essential drugs has increased greatly in absolute number over the 20 years since WHO adopted the essential drugs concept (EDC) and produced the first essential drugs list. Many countries have adopted this concept as a way of rationalizing the drug supply system. More than 120 countries regularly review their national list of essential drugs (World Health Organization, 1997e). Drug procurement and distribution in the public sector have been improved through the creation of autonomous central medical stores and through schemes such as the Bamako Initiative including alternative financing methods such as cost-sharing. The rapid development of the private sector has contributed to the availability of drugs in most countries; nevertheless, Governments are still looking for ways to reduce the cost of drugs to the consumer and thereby improve accessibility. In spite of this progress, it is estimated that over one third of the world's population still lack regular access to essential drugs and that in some regions of the world, particularly those containing the poorest countries of Africa and Asia, over 50 per cent of the population do not have access to essential drugs (World Health Organization, 1996b, map 8).

Pharmaceuticals represent between one third and two thirds of total health-care costs with 50-90 per cent of drug expenditures in most countries paid for privately. In many countries, the Government's drug budget is still insufficient to cover the most basic needs. With the greatest burden of health-care drug costs falling heavily on those least able to pay, equity of access represents a growing concern. In addition, policies to protect the poor and give them access to the essential drugs they need have not been very effective.

During the past 10 years, there has been an improvement in the use of drugs by prescribers and the public. Training

of medical doctors and other health-care professionals is increasingly based on principles of good prescribing practices. A number of countries are exploring creative approaches to public education on the rational use of drugs. Nevertheless, between one quarter and three quarters of antibiotics are prescribed inappropriately, even in teaching hospitals. On average, 50 per cent of patients worldwide fail to take their medicines correctly, resulting in excess mortality from common infections, emergence of resistance to drugs, and inadequate treatments of chronic illnesses. Evidently, both prescribers and consumers are still poorly informed.

Many countries have expanded their drug regulatory capacity using norms and standards developed by WHO. Networks of drug regulators have been organized in Latin America, Africa, Asian countries and the newly independent States. Nevertheless, drug quality remains a concern and substandard and counterfeit drugs are becoming common in international commerce. The scarcity of human and financial resources exacerbated by government cutbacks undermines the ability of drug regulatory authorities to ensure that drugs on the market are safe, effective and of acceptable quality.

Finally, as many as 60 countries have developed national drug policies within the context of national health policy and it is now widely accepted that each country should make a positive effort to achieve optimal availability and use of drugs among patients and consumers.

F. Measures to improve sanitation and access to clean water

Lack of basic sanitation, water supply and food safety continues to contribute greatly to diarrhoeal disease mortality and morbidity. The number of deaths from diarrhoea may have fallen but action to deal with the root causes is still lacking. From 1990 to 1994, the number of people without sanitation increased by nearly 300 million, and in 1994 totalled 2,900 million for developing countries; this figure is projected to increase to 3,300 million by the year 2000. From 1990 to 1994, nearly 800 million people gained access to safe water supplies but, owing to population growth, the number of unserved decreased only from 1,600 million in 1990 to 1,100 million in 1994. In terms of access to both sanitation and safe water, the rural population is worse off. In 1994, sanitation coverage in rural areas was a mere 18 per cent whereas in urban areas it was 63 per cent. Similarly, as regards access to water there was 70 per cent coverage in rural areas but 82 per cent in urban areas (World Health Organization/United Nations Children's Fund, 1996b). There are great inequities between countries and regions; Africa has the lowest coverage with respect to safe water, estimated at 46 per cent in 1994, while Asia has the lowest coverage with respect to environmental sanitation, amounting to 29 per cent (World Health Orgaization/United Nations Children's Fund, 1996b).

A reasonably optimistic situation exists in a few countries. Thus Pakistan increased the proportion of the population with access to health care from 65 per cent in 1980 to 85 per cent in 1993, the proportion with safe water from 38 per cent in 1980 to 60 per cent in 1994-1995, and the proportion with sanitation from 16 per cent in 1980 to 30 per cent in 1994-1995. Saudi Arabia showed similar improvements in access to health care, with the proportion increasing from 85 per cent in 1980 to 98 per cent in 1993; in access to safe water, with the proportion increasing from 91 per cent in 1980 to 93 per cent in 1994-1995; and in access to sanitation, with the proportion increasing from 76 per cent in 1980 to 86 per cent in 1994-1995. Côte d'Ivoire's estimates for safe water coverage rose from 20 per cent in 1980 to 82 per cent in 1994-1995 and for sanitation coverage, from 17 per cent in 1980 to 54 per cent in 1994-1995 (World Bank, 1997, section entitled "Selected world development indicators", table 6).

In many developing countries, there is still a strong urban bias in regard to access to potable water, adequate sanitation and health clinics. In Sierra Leone, for instance, 90 per cent of the urban population has access to health facilities, compared with only 20 per cent of the rural population. Even in a higher-income country such as Argentina, 77 per cent of the people in urban areas, but only 29 per cent of those in rural areas, have access to safe water.

One encouraging development is that the focus is shifting from quality of drinking water alone towards overall environmental improvement involving water supply, sanitation, hygiene, education and general community involvement in environmental management (Tarimo and Webster, 1997, p. 39).

Another positive development is the expanding acceptance of the notion of "healthy public policies" aimed at creating a healthy environment; these can be a potent means of focusing government attention on this neglected health sector. The Healthy Cities movement, started in 1986 as a health promotion demonstration project in the European Region of WHO, is now firmly established and has proliferated to embrace healthy villages, healthy islands, health-promoting schools, healthy workplaces (with the accent on safety) and baby-friendly hospitals. These interrelated projects lay emphasis on health promotion and seek to make health issues understandable and relevant to the work of local governments and other bodies. They are truly intersectoral and support local health authorities and local governments in two activities that are often new to them: monitoring environmental factors and their impact on health; and putting forward specific health policy recommendations for relevant departments such as water and sanitation, industry and education. There are already more than 2,500 Healthy City initiatives in action around the world.

The Fourth International Conference on Health Promotion, held in Jakarta in July 1997, laid emphasis on "health literacy" — the capacity to understand the ways in which individual, social, societal and global health conditions interact and how to cope with their impact in a coherent way. Advocacy is needed to make health promotion as much a part of the social and human health agenda as of the health agenda per se (World Health Organization, 1997f, pp. 10-11).

G. Reform of the health sector

There is a worldwide awareness of the need for health sector reform, although the methods adopted to do so vary considerably. Broad overall goals include:

(*a*) To improve health status and consumer satisfaction by increasing the effectiveness and quality of services;

(*b*) To obtain greater equity by improving the access of disadvantaged groups to quality care, and ensuring that an essential package of services reaches the most vulnerable;

(c) To obtain greater value for the money (cost-effectiveness) from health spending, by improving both the distribution of resources to priority activities and the management and use of those resources.

The strategy for change in most countries emphasizes decentralizing responsibility to local levels, privatizing health-care services and placing greater emphasis on individual choice and responsibility for health-care costs. Decentralization may take several forms, but in all cases it has meant significant changes in health-care financing, training, supplies or levels of resources. The dearth of data, however, makes it nearly impossible to judge as yet how system performance has changed over time. A better flow of information would permit a more rational analysis of trends in a country's health status; the spread of information technology should make this task easier in the future.

Experiences in a few African countries raise serious concerns which have yet to be addressed. For example, in Burkina Faso, Mali and South Africa, broader political change has itself strengthened political accountability for health services; but there are already signs that a failure to think through the consequences of changes in roles and authority at different levels may lead to slow, piecemeal or problem-creating patterns of change. Botswana has long experience with local government decentralization, but only limited planning activities are undertaken at district level and the planning cycles of the different levels appear rather uncoordinated. The central Ministry of Health is responsible for overall manpower planning, with only limited input from district level, while community participation and intersectoral collaboration remain weak.

Substantial and rapid change has been implemented in the last five years in Uganda and Zambia. Local governments in Uganda have been given considerable authority over financial and human resources, and this has led to greater local involvement in planning and resource allocation. In Zambia, the changes introduced so far have focused on planning and financial management. Resources, including those for previously vertical programmes, are now allocated between levels of care and districts, on the basis of a needs-based mechanism aimed at promoting a reallocation of resources towards primary care and poorer districts.

In most countries of the world, there is an urgent need for regulatory mechanisms to ensure that consumers' interests are protected in their dealings with health-care providers, who often hold a near-monopoly of both information and access to treatment. While competition among providers of care has the potential to improve the quality of care, there remains a concern that competition may not necessarily lead to greater accessibility to and equity in health care.

The whole question of the public/private mix for health has been much debated during the last several years. While this offers advantages in terms of mobilizing finance, providing a degree of choice to consumers and encouraging innovative approaches by the private sector, the risk is that the public and private sectors may compete for the same resources, both financial and human. In many cases, the private sector offers only the more remunerative services, which are easier to provide and most in demand, leaving responsibility for the poor, for emergency care and for training to the Government (Mclake, 1997). Another adverse consequence of the public/private mix, unless it is carefully controlled, is the risk of creating greater inequity in the health-care system, as well as duplication and waste. A further risk is that sustainable funding for health resources may decline.

Some analysts see decentralization as an important tool for implementing primary health care policies, more specifically as a means of empowering local communities, coordinating activities at the local level, stimulating participatory planning in response to local demands and strengthening community participation. At the same time, decentralization has been promoted as a means of improving the efficiency, management and responsiveness of government health services (World Bank, 1993). It seems also to be increasingly linked with the transfer of assets from the public to the private sector and the use of market mechanisms, such as the internal market and the purchaser-provider split, to allocate resources. Decentralization measures probably have a greater chance for success if they have won the support of the central health bureaucracy and political leaders, and of the communities to which authority has been decentralized (Kutzin, 1994, p. 45).

In view of the inability of the private sector market to ensure universal access to care, Governments in many countries have chosen to intervene to guarantee at least a minimum level of essential care for the poorest people. However, as a means of health-care financing for the poor, exemption mechanisms have proved ineffective in ensuring access to basic services. In the face of inadequate government funding for the health services, private payment has become a fact of life in most parts of the world. Indeed, the evidence suggests that the share of private finance in a country's health services is inversely proportional to a country's level of income (in other words, the poorer the country, the greater the share of private care) (World Bank, 1993). Thus, even without a formal system of user fees, access to care is inequitable, in part because of the payments in kind that must be made if services are to be rendered. In the context of poor countries, much depends on how well the money is managed. Where the available finances are well managed, the quality of care can be improved (for example, by making the drug supply more efficient), and this has been shown to counteract the demand-dampening effects of user fees under certain circumstances.

Again, where the system has taken the form of employer/employee government contributions to public or private health insurance schemes, such schemes have benefited workers and their families but have also increased the gap in regard to access between rich and poor. In the end, it remains a government responsibility to finance health services for the poorest members of society.

H. Conclusion

All over the world, the health sector is in a process of change. As a result, health systems and health policy stand today at a crossroads. One route leads to health's increasing subservience to short-term economic policy needs. A much greater role for market mechanisms in the financing and provision of health services will follow. Public capital —

hospitals, clinics, medical schools, laboratories; medical stores — may be sold off. Insurance schemes and community financing will be encouraged, as will private providers. Implicitly, the Government will reduce or abandon its strategies to provide for the most needy; this has already become the case for large segments of the world's population (World Health Organization, 1996c).

A second route leads Governments to focus specifically on the health needs of the poorest, and to allow the better-off and the employed to make their own health-care arrangements. This could be called the "safety-net" path, by which Governments reduce their subsidy to higher-income groups so as to target public funding on poorer populations and rural areas. One adverse consequence could be a growing gap between standards of care for the rich and the poor — that is to say, poor services for poor people.

However, a third and more desirable route leads to a policy focus on the whole population's risks and resources, and on all sources of finance and service provision. Here the Government's role is as overall strategist, coordinator and regulator; it may be only a limited actor in service provision but it can use its financing power to guarantee access to care by those in need. This route requires a new and sharper definition of the role and presence of the Government among all the many health providers, consumers, financiers and regulators. It will call for new public roles and competencies, with particular emphasis on information and negotiation (World Health Organization, 1996c).

Possible scenarios in health for the twenty-first century include the continuation of current economic policy trends towards use of market incentives, accompanied by rapid progress in information and health technologies, an increasing global market in health-care products such as pharmaceuticals and diagnostic equipment, and greater mobility of human resources and private capital flows in health. There will be an increased emphasis on privatization and therefore on individual responsibility for health, and users will expect greater choice in and control over their own health care. On present showing, this will risk increasing inequities and widening still further the gaps that exist between rich and poor, between and within countries. Wise planning on the part of Governments and donors alike will be needed to foresee and avert such risks.

These factors, together with changing disease and demographic patterns, will exert increasing pressures on Governments to be transparent and accountable for their decisions. Ministries of health will increasingly be required to recognize the growing plurality of stakeholders in health, and to define overall strategies and regulatory approaches in an environment of growing complexity and pressure. They will need better information, new skills and innovative approaches to tackle these challenges (World Health Organization, 1997g).

From data currently available, the steps that urgently need to be taken in order to achieve progress in the fields of primary health care and the health-care sector are the following:

(*a*) To ensure that Governments, particularly in developing countries, truly accord priority to resources for health in order to strengthen provision of primary health care;

(*b*) To concentrate efforts aimed at redressing the widening inequities in accessibility and health status;

(*c*) To actively promote community participation and empowerment, in terms not only of meeting needs but of finding more effective means of utilizing the available resources;

(*d*) To mobilize greater solidarity of the international community with countries, especially poor countries, with a view to addressing the great problems of health and providing the necessary resources to support health action.

In summary, there is no room for complacency. All Governments should fulfil their commitment to the objectives that were adopted at the International Conference on Population and Development in 1994, in order to devise health policies that are truly relevant to the lives of their people and to the interests of their communities. Particular emphasis should be given in the future to monitoring the progress made in implementing policies and meeting goals and objectives; monitoring has in the past been a notable weak link. Finally, the hallmarks of good governance for health — at all levels — are transparency, accountability and incentives that promote participation (World Health Organization, 1997a, p. 27).

Note

[1]The Development Assistance Committee is a specialized committee of the Organisation for Economic Cooperation and Development (OECD) which consists of 21 of the wealthier countries and the Commission of the European Communities.

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II. LEVELS AND TRENDS OF MORTALITY

A. Global levels and trends

Since the Second World War, remarkable progress has been achieved in the reduction of mortality with the result that in 1990-1995, the global average life expectancy at birth was estimated at 64.3 years, a level typical for the more developed regions in the early 1950s (table 1). Life expectancy increased by 17.1 years for males and by 18.6 years for females between 1950-1955 and 1990-1995. Life expectancy of females increased at a slightly faster pace than that of males, and the sex differential in life expectancy at birth in favour of women rose from 2.7 years in 1950-1955 to 4.3 years in 1990-1995.

The crude death rate for the world as a whole declined from almost 20 per 1,000 in 1950-1955 to slightly more than 9 per 1,000 in 1990-1995. The annual number of deaths was decreasing from 1950 to 1975, but has since then been slowly increasing. The reversal in the trend, despite continuing gains in life expectancy, is due to a combination of population ageing and the continuing increase in the total population size of the world.

Figure 1 shows the distribution of deaths by age in the more developed regions and the less developed regions in 1990-1995. Deaths are extremely unequally distributed across the age range. The distribution, which depends on the age pattern of mortality and the age structure of the population, differs greatly between regions and countries. At the global level, almost half (47 per cent) of all deaths occur either in the youngest (under age 5) or in the oldest (age 75 and older) age intervals, with deaths at old ages outnumbering deaths at young ages by 18 per cent. In the more developed regions, as a result of the combination of an older age structure and a low mortality level, 51 per cent of all deaths occur over age 75 and less than 2 per cent under age 5. In the less developed regions, because of a younger age structure and a higher infant and child mortality, 28 per cent of all deaths are of children under age 5, while 18 per cent occur above age 75.

B. More developed regions

Throughout the period 1950-1955 to 1990-1995, mortality levels continued to decline in the more developed regions. The average life expectancy for both sexes combined increased from 66.5 years in 1950-1955 to 74.2 years in 1990-1995, an absolute gain of 7.7 years. The life expectancy for men as of 1990-1995 was 70.4 years and for women 78.0 years. In most developed countries, reductions of mortality in adult ages, and especially in advanced ages, have made a major contribution to rising life expectancies. Southern Europe achieved the fastest mortality decline, recording a gain of 12.7 years in four decades and reaching a life expectancy at birth of 76.0 years in 1990-1995. Australia-New Zealand (77.4 years), Western Europe (76.7 years) and Northern America (76.2 years) were the regions with the highest levels of life expectancy. Eastern Europe had the lowest level (68.2 years) and the slowest increase since 1950-1955 (2.7 years). Eastern Europe currently ranks behind the less developed regions of the Caribbean, Central America and Eastern Asia in terms of levels of mortality. The differences in the pace of mortality change between Eastern Europe and the other more developed regions also caused a widening of the gap in life expectancy between regions, from a difference of 5.9 years in 1950-1955 between Northern Europe and Southern Europe to 9.2 years in 1990-1995 between Australia/New Zealand and Eastern Europe.

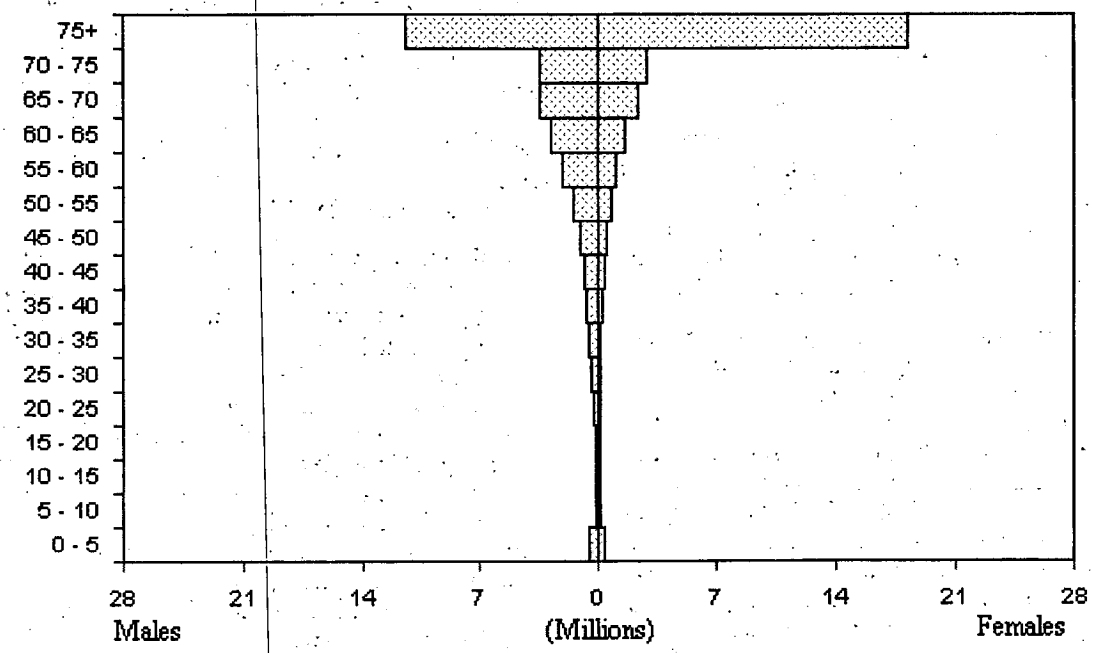
Table 1. Selected mortality indicators, world, 1950-1995

Period	*Life expectancy at birth (years)*			*Crude death rate (per 1,000)*	*Average annual number of deaths (millions)*
	Both sexes	*Males*	*Females*		
1950-1955	46.5	45.1	47.8	19.8	52.2
1955-1960	49.6	48.1	51.0	17.3	50.2
1960-1965	52.3	51.0	53.7	15.6	49.6
1965-1970	56.0	54.5	57.4	13.4	47.2
1970-1975	57.9	56.4	59.4	11.7	45.4
1975-1980	59.7	58.0	61.5	11.0	46.8
1980-1985	61.3	59.4	63.3	10.3	47.9
1985-1990	63.1	61.1	65.1	9.6	48.5
1990-1995	64.3	62.2	66.5	9.3	51.1

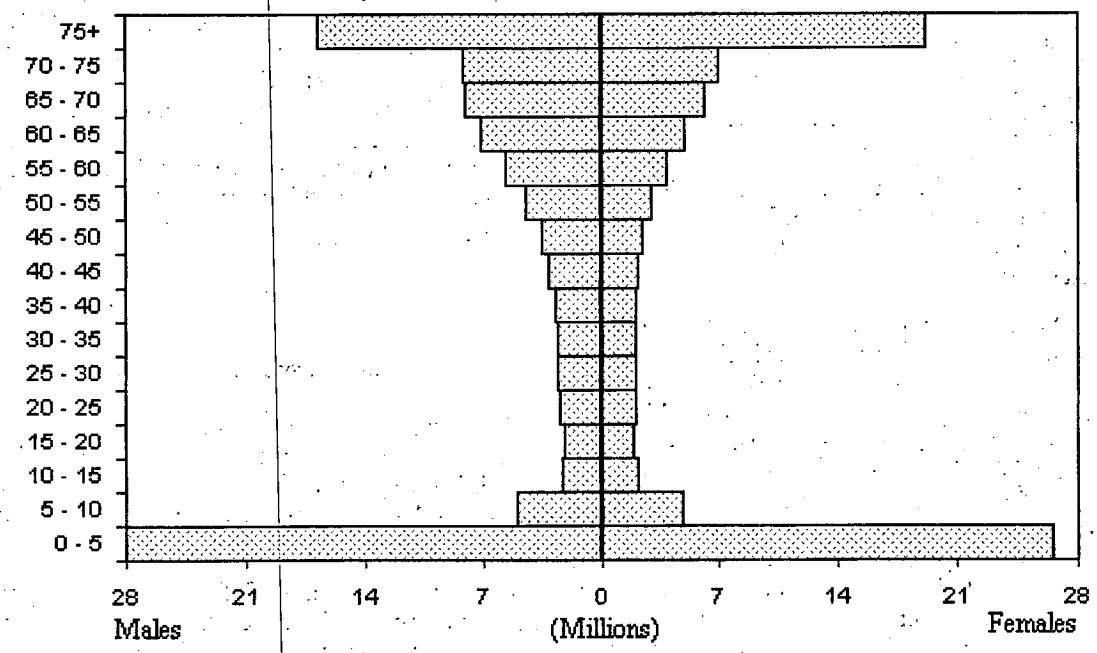
Source: World Population Prospects: The 1996 Revision (United Nations publication, Sales No. E.98.XIII.5).

Figure 1. Death by age and sex, 1990-1995

(a) More developed regions



(b) Less developed regions



Source: ***World Population Propsects: The 1996 Revision*** **(United Nations publication, Sales No. E.98.XIII.5).**

The countries with the highest life expectancies in 1990-1995 were Japan (79.5 years), Iceland (78.8 years) and Sweden (78.1 years). On the other hand, all countries of Eastern Europe and the Baltic countries had life expectancies of 72 years or less, with eight countries exhibiting life expectancies of less than 70 years. The lowest life expectancies were recorded for the Russian Federation (66.5 years), the Republic of Moldova (67.6 years) and Latvia (68.4 years).

C. Less developed regions

Life expectancy at birth for the less developed regions is estimated to have increased to 62.1 years for both sexes in 1990-1995, to 60.6 years for males and to 63.7 years for females. Life expectancy has risen more rapidly in the less developed regions than in the more developed regions, so that the differential between the two has narrowed considerably, from 25.6 years in the early 1950s to 12.1 years in 1990-1995.

Progress in the less developed regions has been uneven and current levels of life expectancy vary widely between countries and regions. Asia achieved the largest absolute gain in life expectancy between 1950-1955 and 1990-1995, with an increase from 41.3 to 64.5 years. Gains exceeding 20 years were achieved by the most populous Asian nations: China, India, Indonesia, Pakistan, the Philippines, Thailand and Turkey. Several Asian countries have reached a life expectancy above 70 years. The countries with the highest life expectancies in 1990-1995 were Israel (77.0 years), Cyprus and Macau (76.8 years) and Singapore (76.3 years). However, some Asian countries, such as Afghanistan (43.5 years in 1990-1995), still have some of the lowest expectations of life in the world.

In Latin America and the Caribbean, life expectancy increased less rapidly between 1950-1995 and 1990-1995 (17.1 years) than in Asia, reaching 68.5 years in 1990-1995. Mortality levels are less diverse in Latin America and the Caribbean than in the other developing regions. Only two countries are estimated to have had life expectancies below 60 years in 1990-1995: Bolivia (59.4 years) and Haiti (54.4 years). Life expectancies above 75 years have been achieved by Costa Rica (76.3 years) and several of the Carribbean islands, including Cuba (75.3 years).

Africa continued to lag further behind the other less developed regions, with a 14-year increase in life expectancy at birth, from 37.8 years in 1950-1955 to 51.8 years in 1990-1995. In addition, the gap in life expectancy at birth between Eastern, Middle and Western Africa on the one hand, and Northern and Southern Africa, on the other, has continued to widen. Mortality levels are lowest in Northern and Southern Africa where life expectancy at birth is estimated to have reached 62.1 years in 1990-1995. That Eastern, Middle and Western Africa include countries that have been worst hit by the human immunodefiency virus/acquired immunodefiency syndrome (HIV/AIDS) epidemic accounts in part for the widening gap in life expectancy. The countries with the lowest mortality include Algeria, with an estimated life expectancy at birth in 1990-1995 of 67.1 years; Tunisia (67.8 years); and two small islands, Mauritius (70.2 years) and Réunion (74.0 years).

The average life expectancy at birth for the least developed countries increased from 35.5 years in 1950-1955 to 49.7 years in 1990-1995. Although the least developed countries, most of which are in sub-Saharan Africa, achieved an increase in life expectancy of 14.2 years, progress has been slower than in the other developing countries. The fact that the average annual increment in life expectancy from 1950-1955 to 1990-1995 was 0.4 years in the least developed countries as compared with 0.6 years in the less developed regions (with the least developed countries excluded) means that the least developed countries have fallen further behind the rest of the world. While in 1950-1955 the average life expectancy in the group of the least developed countries had been 6.2 years lower than the average for the less developed regions with that group excluded, by 1990-1995 the gap had widened to 14.6 years.

Goals for improvement in life expectancy have been adopted in two recent major international conferences: in 1994 by the International Conference on Population and Development and in 1995 by the World Summit for Social Development (box 2). The Programme of Action of the International Conference on Population and Development stated that "Countries should aim to achieve by 2005 a life expectancy at birth greater than 70 years and by 2015 a life expectancy at birth greater than 75 years. Countries with the highest levels of mortality should aim to achieve by 2005 a life expectancy at birth greater than 65 years and by 2015 a life expectancy at birth greater than 70 years" (United Nations, 1995, chap. I, resolution 1, annex, para. 8.5). The World Summit for Social Development adopted a goal of not less than 60 years by the year 2000 (United Nations, 1996, chap. I, resolution 1, annex, para. 36(b)).

Should the mortality assumptions of the most recent United Nations population projections hold, 51 countries, most of them in Africa, would not reach the goal adopted by the World Summit for Social Development. With regard to the goals adopted by the International Conference on Population and Development, 71 countries would not reach a life expectancy at birth of 70 years by the year 2005 and 111 would not reach a life expectancy at birth of 75 years by the year 2015.

D. Recent reversals of mortality decline

1. *Demographic impact of HIV/AIDS*

An estimated 5.8 million new HIV infections occurred during 1997 (see chap. V of the present publication). Over 30 million people were living with HIV infection or AIDS and about 2.3 million people, including 460,000 children, died of HIV/AIDS-related illnesses in 1997.

More than 90 per cent of HIV infections occur in a limited number of developing countries. Twenty-four of these countries are from sub-Saharan Africa: Benin, Botswana, Burkina Faso, Burundi, Cameroon, the Central African Republic, Chad, the Congo, Côte d'Ivoire, the Democratic Republic of the Congo, Eritrea, Guinea-Bissau, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, Sierra Leone, Togo, Uganda, the United Republic of Tanzania,

BOX 2. GOALS IN TERMS OF LIFE EXPECTANCY AT BIRTH AGREED UPON AT UNITED NATIONS CONFERENCES AND SUMMITS

World Population Conference, 1974: "The attainment of an average expectation of life of 62 years by 1985 and 74 years by the year 2000 for the world as a whole would require by the end of the century an increase of 11 years for Latin America, 17 years for Asia and 28 years for Africa. Countries with the highest mortality levels should aim by 1985 to have an expectation of life at birth of at least 50 years..."[a]

International Conference on Population, 1984: "Countries with higher mortality levels should aim for a life expectancy at birth of at least 60 years ... by the year 2000. Countries with intermediate mortality levels should aim to achieve a life expectancy at birth of at least 70 years ... by the year 2000."[b]

International Conference on Population and Development, 1994: "Countries should aim to achieve by 2005 a life expectancy at birth greater than 70 years and by 2015 a life expectancy at birth greater than 75 years. Countries with the highest levels of mortality should aim to achieve by 2005 a life expectancy at birth greater than 65 years and by 2015 a life expectancy at birth greater than 70 years."[c]

World Summit for Social Development, 1995: "Governments should implement the commitments that have been made to meet the basic needs of all... including, *inter alia*, the following: by the year 2000, life expectancy of not less than 60 years in any country."[d]

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[a] *Report of the United Nations World Population Conference, 1974, Bucharest, 19-30 August 1974* (United Nations publication, Sales No. E.75.XIII.3), chap. I, para. 22-23.

[b] *Report of the International Conference on Population, 1984, Mexico City, 6-14 August 1984* (United Nations publication, Sales No. E.84.XIII.8 and corrigenda), chap.I, sect. B, recommendation 14.

[c] *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, para 8.5.

[d] *Report of the World Summit for Social Development, Copenhagen, 6-12 March 1995* (United Nations publication, Sales No. E.96.IV.8), chap. I, resolution 1, annex II, para. 36.

Zambia and Zimbabwe; two from Asia: India and Thailand; and two from Latin America: Brazil and Haiti. The estimated prevalence of HIV ranges from less than 1 per cent of the adult population in India and Brazil to 15 per cent in Botswana and Zimbabwe.

The impact of HIV/AIDS is particularly devastating in sub-Saharan Africa, where the widespread transmission of the virus began in the late 1970s and early 1980s. During 1985-1995, the epidemic killed 4.2 million people in Africa, which represents 90 per cent of all additional deaths due to AIDS in the less developed regions (table 2). In Africa, the mortality impact of AIDS would reach its peak in 1995-2005, when the crude death rate is expected to remain almost one quarter higher than without AIDS and the number of AIDS-related deaths will reach 9.4 million. During the 30-year period of 1985-2015, the epidemic is expected to cause 20.1 million additional deaths in Africa. Because of AIDS, life expectancy has stagnated or even declined in several African countries and this trend is projected to continue through the year 2000. Without AIDS, the aggregate life expectancy of the 24 African countries is projected at 55 years in 1995-2000; AIDS has lowered it by six years.

Botswana, Malawi, Uganda, Zambia and Zimbabwe are hit hardest by the epidemic: currently, more than 10 per cent of the adult population in those countries is infected with HIV. The death toll of AIDS for the period 1985-1995 is estimated at 1.5 million additional deaths and the life expectancy at birth decreased by an average of four years (figure 2). Yet, the demographic impact of AIDS is projected to intensify in the next 10 years: the epidemic is expected to cause another 3.1 million deaths in 1995-2015 and the life expectancy at the end of the period is projected to be 12 years lower than without AIDS. Although the AIDS epidemic increases the number of deaths in each age category, its largest mortality impacts are in otherwise relatively robust years of life: it is estimated that in these five most affected countries, mortality during 1985-2005 will increase by 160 per cent in the age group 35-49 compared with 33 per cent for the population in general.

The AIDS epidemic hit the Asian countries in the second half of the 1980s, and is spreading fast. As a result, the number of additional deaths caused by AIDS, assessed at less than 0.2 million for 1985-1995, is projected to mushroom to 3.7 million in 1995-2005 and 6.6 million in 2005-2015. This dynamic will raise Asia's share in the total number of AIDS-related deaths from the current 4 per cent to 47 per cent in 2005-2015. The spread of AIDS in Latin America and the Caribbean started earlier, in the early 1980s, but the epidemic there has not spread as fast as in other major areas. The number of additional deaths due to AIDS, estimated at 0.4 million for 1985-1995, is projected to reach 2.0 million in 1995-2015. Overall, the death toll of AIDS in the developing countries is projected to increase from 4.7 million additional deaths in 1985-1995 to 14.2 million in 1995-2005 and 13.9 million in 2005-2015.

2. *Health crisis in countries with economies in transition*

Mortality trends in the countries that have had centrally planned economies until the late 1980s or early 1990s (and are currently defined as transition economies) differ from the steady improvements in life expectancy achieved by the countries with established market economies. From the post-Second World War period to the mid-1960s, life expectancy in the former Union of Soviet Socialist Republics (USSR) and most Eastern European countries was rising steadily, approaching levels in Northern America and Western Europe. Life expectancy in the countries of Eastern Europe then stagnated for almost 20 years, with ensuing periods of little improvements and occasional declines which were however, relatively shallow and brief (figure 3). The life expectancy (both sexes combined) in Eastern Europe, excluding the countries of the former USSR, varied in 1990-1995 from 69.0 years (Hungary) to 72.0 years (the Czech Republic), whereas in the European Union it ranged from 74.4 years (Portugal) to 78.1 years (Sweden).

The situation is worse among the European newly independent States[1] formed following the dissolution of the Soviet Union. Within a time period of five to eight years, life expectancy has deteriorated in each country of this group with the decreases (for both sexes combined) ranging from 2.7 years in Estonia to 5.9 years in the Russian Federation (see figure 4).

Following the break-up of the Soviet Union, reports of an unprecedented drop in life expectancy in its successor States began to receive wide attention. Yet declines in life expectancy are not a new phenomenon in this region. A notable decline in life expectancy in the Soviet Union occurred during the 1960s. It continued for more than two decades, followed by an increase in the 1980s.

The impact of improvements in controlling infectious and parasitic diseases had resulted in the spectacular decrease of infant mortality (for example, in the Russian Federation, infant mortality declined from 200 per 1,000 live births in

TABLE 2. ADDITIONAL DEATHS DUE TO AIDS, 1985-2015

Major area	Number of countries studied	Percentage of all current infections in the major area	Additional deaths due to AIDS in the countries studied (thousands)			Additional deaths due to AIDS extrapolated to the entire major area (thousands)		
			Estimated through 1995	Projected for 1995-2005	Projected for 2005-2015	Estimated through 1995	Projected for 1995-2005	Projected for 2005-2015
Africa.....	24	79	3 326	7 418	5 138	4 210	9 390	6 504
Asia	2	88	161	3 234	5 792	183	3 675	6 582
Latin America and the Caribbean.....	2	54	223	602	448	413	1 115	830
Total, less developed regions.....	28	79	3 710	11 254	11 378	4 696	14 180	13 916

Source: World Population Prospects: The 1996 Revision (United Nations publication, Sales No. E.98.XIII.5).

1940 to 26 per 1,000 live births in 1965) underlying the steep rise in life expectancy. Life expectancy gained an average of 1.3 years per annum during the period from the end of the Second World War until the mid-1960s. The increase subsided by 1965 and was followed by a period of stagnating or falling life expectancy, interrupted only once by a significant but short-lived rise in the mid-1980s. The stagnation was the result of two opposing trends: slowly improving child survival and deteriorating survival of adults, especially males in the prime working ages of 20-49 (Shkolnikov and Meslé, 1997).

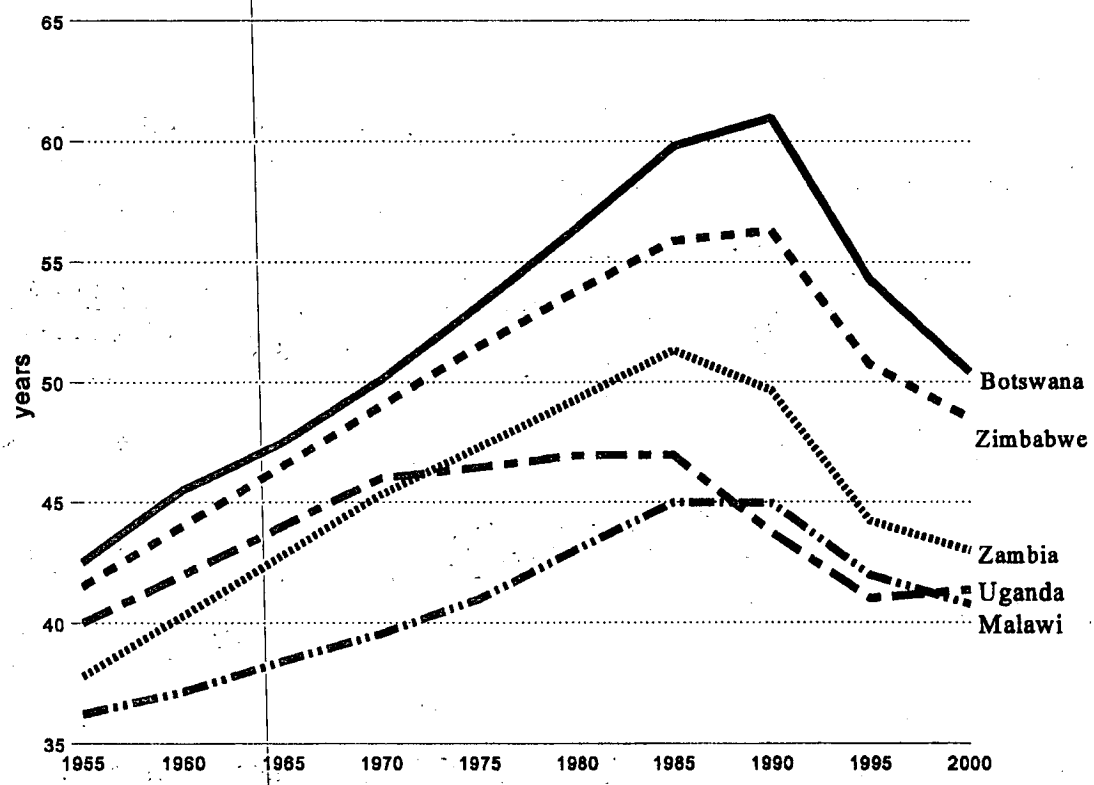
The recent increase in adult mortality, often labelled an epidemiological, health or demographic crisis or catastrophe, is still unique in several respects. It was well documented and was promptly recognized officially as a serious problem, whereas before 1975 detailed information on the demographic and epidemiological dynamics in the former USSR was largely restricted and between 1975 and 1986 almost completely suppressed (Anderson and Silver, 1997). The magnitude of the recent increase of premature mortality in the Russian Federation is unprecedented in peace and a famine-free time of peace. Life expectancy for males fell from 63.5 years in 1991 to 57.6 years in 1994; for females it dropped 3.2 years during the same period, from 74.3 years to 71.1 years.

The explanation for the increase in mortality in the Russian Federation after 1991 may lie entirely or partly in the reversal of the exceptional conditions created by the anti-alcohol campaign of the mid-1980s. During 1985-1990, the population groups most exposed to certain risks of deaths were temporarily spared and this, by some assessments, helped to prevent 900,000 premature deaths from violence, accidents and poisonings (United Nations Development Programme, 1996a). The following period of 1991-1994 was marked by a swift return to the previous unfavourable trends (Avdeev, and others 1997; Blum and Zakharov, 1997). The most recent data, however, show a slight improvement: in 1995 life expectancy increased to 58.3 years for males and to 71.7 years for females (see annex table A.1).

3. *Other instances of increased mortality*

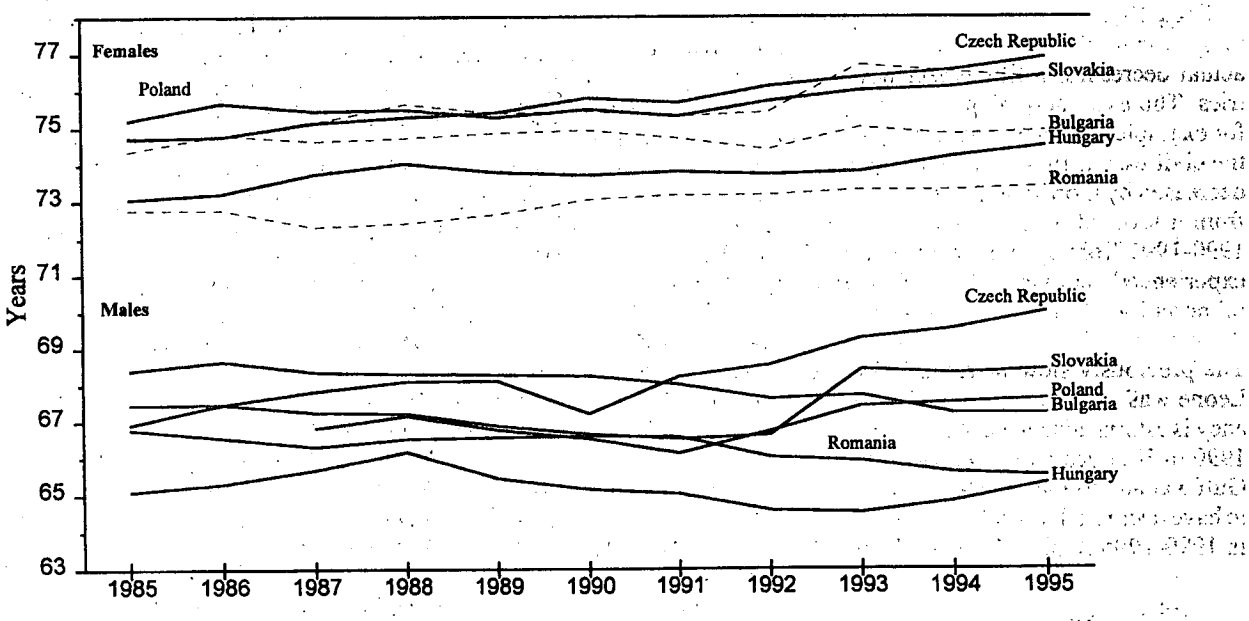
Since the end of the Second World War, there have been more than 150 local wars in Africa, Asia, Europe and Latin America. During this period, the percentage of direct war deaths among civilians has increased steadily, and in recent years it is estimated that approximately nine times as many civilians as military personnel have been killed by weapons during wars (World Health Organization, 1997). In addition to inflicting direct injuries, armed conflicts have detri-

Figure 2. Life expectancy in countries where adult HIV prevalence exceeds 10 per cent



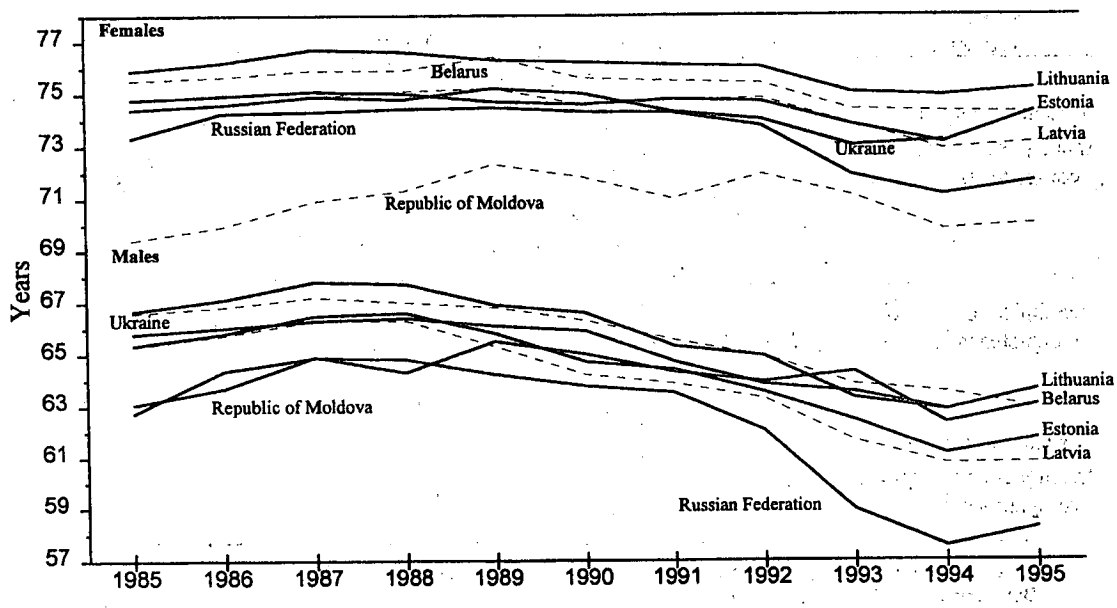
Source: World Population Prospects: The 1996 Revision (United Nations publication, Sales No. E.98.XIII.5).

Figure 3. Life expectancy at birth, selected Eastern European countries, 1985-1995



Source: Data supplied by United Nations Statistics Division.

Figure 4. Life expectancy at birth, European countries of the former USSR, 1985-1995



Source: Data supplied by United Nations Statistics Division.

mental effects on people's health because they cause disruptions of economic and social life, large-scale impoverishment, widespread malnutrition and diseases.

Since 1985, it is estimated, based on the available but highly incomplete and deficient data, that wars have caused actual decreases in life expectancy in a number of countries. The extremely high estimated mortality in Rwanda, for example, during the period 1990-1995 was the result of the civil war in 1994. Life expectancy is estimated to have decreased by more than 50 per cent through having dropped from a level of 46.7 years in 1985-1990 to 22.6 years in 1990-1995. Torn by civil unrest and ethnic conflicts, Liberia experienced a similar, although less profound, deterioration of mortality conditions: life expectancy is estimated to have declined by 14 years between 1985-1990 and 1990-1995. The previously slow increase in life expectancy in Sierra Leone was reversed by civil disturbances, and life expectancy is estimated to have decreased from 36.9 years in 1985-1990 to 34.4 years in 1990-1995. In Iraq, as a result of the Gulf war and its consequences, life expectancy is estimated to have decreased from 64.9 years in 1985-1990 to 58.8 years in 1990-1995 (United Nations, 1998).

E. Data sources and estimation issues

Deficiencies and inaccuracies of data remain serious handicaps in the analysis of mortality levels and trends in developing countries. Civil registration data constitute in principle the best source of aggregate mortality statistics, provided that the registration is complete, timely and accurate, in particular with respect to age (United Nations, 1973). The completeness and the accuracy of the data produced by national civil registration systems vary, however, from one country or area to another, with differential geographical or ethnic coverage being not uncommon. Delayed registration of deaths, errors in the declaration of age and other errors make mortality statistics in many countries or areas an inadequate basis for the assessment of national levels and trends or for international comparisons.

Registration of deaths is reported to be complete in about half of all countries or areas (see table 3). Coverage in terms of population is considerably smaller: only slightly more than a quarter of the world's population lives in countries where registration of deaths is reported to virtually complete. Registration is complete in nearly all countries of Europe, in Northern America, Japan, Australia and New Zealand. This situation contrasts sharply with Africa where only 6 countries or areas, with a combined population representing a mere 0.3 per cent of that of the continent, have registration that is considered complete. The coverage in the developing countries of Asia and Oceania is also low, while Latin America and the Caribbean ranks closer to the more developed regions.

In countries lacking reliable registration data, data on child mortality are often more readily available and of higher quality than data on adult mortality. In these circumstances, life expectancy at birth can be estimated, where no other relevant data exist, by matching observations of infant and child mortality with appropriate model life-tables. The validity of this approach is determined by the accuracy of the infant and child mortality estimates and by the assumptions about age patterns of mortality and hence by the selection of a

Table 3. Reported completeness of death registration

Completeness of death registration	*Africa*	*Americas*	*Asia*	*Europe*	*Oceania*	*World*
			Number of countries or areas			
Virtually complete[a]	6	36	19	44	11	116
Incomplete or unknown completeness[b]	50	15	31	3	13	112
			Population in 1997 (thousands)			
Virtually complete[a]	2 440	509 500	258 006	729 062	23 199	1 522 208
Incomplete or unknown completeness[b]	755 953	284 152	3 280 448	106	5 871	4 326 530
			Percentage of population			
Virtually complete[a]	0	64	7	100	80	26
Incomplete or unknown completeness[b]	100	36	93	0	20	74

Source: *Population and Vital Statistics Report* (United Nations publication, ST/ESA/STAT/SER.A/201).

[a]Data estimated to be virtually complete, in other words, to represent at least 90 per cent of events occurring each year.

[b]Data estimated to be incomplete, in other words, to represent less than 90 per cent of the events occurring each year, or data for which no specific information is available regarding completeness.

suitable model life-table. Its major drawback lies in the assumption that mortality patterns prevailing in the population under review are accurately represented by an existing family of model life-tables, given that these model life-tables typically represent average mortality conditions that prevail or have prevailed in geographically and culturally different settings.

Another approach, in the absence of conventional data sources, is to use alternative estimation methods. These methods include the estimation of the completeness of registration data or data on deaths by age and sex in a recent reference period, deriving age-specific survival ratios from census data, measuring adult mortality through special surveys or using parental or sibling survival data. These methods suffer from intrinsic deficiencies of the data and assumptions, but are generally to be preferred to extrapolation from information on childhood mortality alone.

In preparing the estimates of mortality levels and trends presented in this publication, all available demographic and supportive data for each country have been brought together. Such data include official national sources (civil registration, population censuses, sample registration systems, demographic surveys), as well as studies and reports on population and demographic parameters and change prepared by non-governmental organiz-ations, research institutes and scholars. All data have been evaluated and adjusted to achieve internal consistency and international comparability, whenever necessary. For countries with no data, the mortality estimates have been extrapolated based on information in neighbouring countries with similar socio-economic and cultural conditions.

Table 4 shows the distribution of developing countries according to the availability of mortality data and the reference period of the latest estimate. The table clearly shows that data on infant and child mortality are more readily available and also more recent than direct estimates of life expectancy at birth. The data situation is particularly poor in Africa where, since 1970, only 13 countries have had sufficient data to derive relatively reliable estimates of life expectancy. In the majority of countries, estimates of life expectancy have been derived either through model life-tables on the basis of information on infant and child mortality or through extrapolation based on information in neighbouring countries.

In preparing the mortality estimates, special attention was given to countries that had undergone or had been undergoing wars, severe civil strife or other outbreaks of violence, or ongoing epidemics such as AIDS. For each such country, life-tables were constructed in two stages. First, using whatever data were available, a life-table was constructed considering only "normal deaths", in other words, deaths from causes other than war or the violence associated with civil strife, given the assumed overall level of mortality. In the second stage, this life-table was modified to incorporate the estimated death toll of war or civil strife. Similarly, for the developing countries significantly affected by the AIDS epidemic, AIDS-related deaths by age and sex in 1990-1995 were estimated by applying the WHO epidemiological model (Chin and Lwanga, 1991) to national data on new HIV infections; those additional deaths were then incorporated into the corresponding national "non-AIDS" life-tables (United Nations, 1998).

TABLE 4. DISTRIBUTION OF DEVELOPING COUNTRIES ACCORDING TO THE AVAILABILITY OF MORTALITY DATA AND THE REFERENCE PERIOD OF LATEST ESTIMATE

Region	*Number of countries or areas in region*	*Number of countries or areas*							
		With data on infant or child mortality				*With estimates of life expectancy at birth*			
		No data since 1970	*1970s*	*1980s*	*1990s*	*No data since 1970*	*1970s*	*1980s*	*1990s*
Africa	53	8	3	13	29	40	6	4	3
Asia and Oceania	58	7	3	13	35	21	3	13	21
Latin America and the Caribbean...	31			6	25	2	2	10	17
Total	141	15	6	31	89	63	11	26	41

Source: *World Population Prospects: The 1996 Revision* (United Nations publications, Sales No. E.98.XIII.5).

Notes

[1]The Asian newly independent States of the former USSR (Armenia, Azerbaijan and Georgia in Western Asia and Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan in South-central Asia) are characterized, *inter alia*, by a lower quality of official mortality statistics (see Anderson and Silver, 1997) and by the fact that they are at a different stage of the epidemiological transition, with higher infant and child mortality and problems common to low-income developing countries (Kingkade and Arriaga, 1997; Murray and Bobadilla, 1997). This precludes the straightforward comparison of mortality levels and trends of the Asian and European countries with those of the transition economies. However, all transition countries share, to different degrees, certain important features. The initial stage of the large-scale political transformation and economic transition was associated with impoverishment of large sections of the population, and deterioration of public infrastructure and of the quality and range of health-care services. As a result, health conditions significantly deteriorated. In addition, armed international conflicts and civil wars imposed heavy tolls on Armenia, Azerbaijan, Georgia and Tajikistan (Cornia and Paniccia, 1995; United Nations Children's Fund, 1994; and United Nations Development Programme, 1995a; 1995b; 1995c; 1995d; 1996b; 1996c).

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III. CHILD SURVIVAL AND HEALTH

The promotion of child survival and health has long been an important aim of the wide range of policies adopted to improve the overall health status of a population. Important advances have been made in making accessible the means to combat the most common diseases of childhood and an increasing number of children are routinely vaccinated against diseases that are potential killers or causes of lifetime disability, such as measles and poliomyelitis. Low-cost interventions have made major inroads into reducing suffering and death from diarrhoeal diseases. Nevertheless, many countries are still experiencing unacceptably high levels of infant and child mortality and even in countries with low average mortality in childhood at the national level there remain segments of the population that experience high mortality. Consequently, the 1990 World Summit for Children (United Nations Children's Fund, 1991) and the International Conference on Population and Development (United Nations, 1995a, chap. I, resolution 1, annex) have called for action to (*a*) promote child survival and health and reduce disparities between and within developed and developing countries as quickly as possible; (*b*) improve the health and nutritional status of infants and children; and (*c*) promote breastfeeding as a child-survival strategy.

Both the World Summit for Children and the International Conference on Population and Development set goals for the reduction of mortality among children (see box 3). According to the Programme of Action of the International Conference on Population and Development, "countries should strive to reduce their infant and under-5 mortality rates by one third, or to 50 and 70 per 1,000 live births, respectively, whichever is less, by the year 2000, with appropriate adaptation to the particular situation of each country. By 2005, countries with intermediate mortality levels should aim to achieve an infant mortality rate below 50 deaths per 1,000 and an under-5 mortality rate below 60 deaths per 1,000 births. By 2015, all countries should aim to achieve an infant mortality rate below 35 per 1,000 live births and an under-5 mortality rate below 45 per 1,000" (United Nations, 1995a, chap. I, resolution 1, annex, para. 8.16).

A. Levels and trends of mortality in childhood

1. *Data issues*

Although the availability of data allowing an assessment of levels and trends of mortality in childhood has improved markedly over the last two decades, there is still a substantial number of countries, mostly in the developing world, for which no recent information is available. In fact, for about one fifth of all developing countries that in 1995 had a population of at least half a million, no estimates of mortality in childhood were available at all. Furthermore, when the aim is to assess trends over a period (1970-1995 in this case), even fewer countries have the required information. Consequently, to make a truly global overview of current mortality levels in childhood, it is necessary to resort to the comprehensive global set of estimates derived from the world population projections prepared by the United Nations, some of which result from extrapolations of the estimates actually available or from imputations based on other information (United Nations, 1998e). The comprehensive set of indicators for each country produced as part of the world population projections provides the basis for the regional estimates discussed below.

For the analysis at the country level, however, the present chapter relies on estimates derived from the different data sources available in any given country, estimates that need not refer to exactly the same period for all countries. Because few developing countries have a reliable and accurate system for the registration of deaths, demographic surveys and censuses are used to provide the basic data needed to estimate child survival. Annex tables A.3 to A.5 present the estimates of infant and under-five mortality for the developing countries discussed below. Their derivation is documented in detail in the database on child mortality maintained by the Population Division of the United Nations Secretariat (United Nations, 1998a; 1998b; 1998c), which contains the basic data from which the estimates are derived, bibliographic information regarding the source of those data, and the estimates themselves. The developing countries covered include all those with at least half a million inhabitants in 1995. The estimates presented in the database have been derived from as many sources as possible, including single-round and multi-round demographic surveys, censuses and civil registration systems. Both direct and indirect estimation methods, as appropriate, have been used in deriving the final estimates. All estimates have been evaluated for consistency and reliability. Consequently, the set displayed in annex tables A.3 to A.5 for countries in the major developing regions of the world (Africa, Asia, and Latin America and the Caribbean) encompasses the best measures of infant and under-five mortality available to date at the country level.

In terms of coverage, estimates of infant mortality for at least one point over the period 1970-1995 could be obtained for 100 of the 122 developing countries with a population of at least 500,000 persons in 1995, and 91 of those countries also had at least one estimate of under-five mortality. In Africa, 43 out of 51 countries had at least one estimate of infant mortality and 42 had at least one estimate of under-five mortality. In Asia, the equivalent numbers were 34 and 26 countries out of a total of 47; and in Latin America and the Caribbean, virtually all countries had at least an estimate of infant mortality (24 out of 24) and of under-five mortality (23 out of 24).

BOX 3. GOALS IN TERMS OF INFANT AND CHILD MORTALITY AGREED UPON AT UNITED NATIONS CONFERENCES AND SUMMITS

World Population Conference, 1974: "Countries with the highest mortality levels should aim by 1985 to have ... an infant mortality rate of less than 120 per thousand live births."[a]

International Conference on Population, 1984: "Countries with higher mortality levels should aim for ... an infant mortality rate of less than 50 per 1,000 live births by the year 2000. Countries with intermediate mortality levels should aim to achieve ... an infant mortality rate of less than 35 per 1,000 live births by the year 2000."[b]

World Summit for Children, 1990: "Between 1990 and the year 2000, reduction of infant and under-5 child mortality rate by one third or to 50 and 70 per 1,000 live births respectively, whichever is less."[c]

International Conference on Population and Development, 1994: "Countries should strive to reduce their infant and under-5 mortality rates by one-third, or to 50 and 70 per 1,000 live births, respectively, whichever is less, by the year 2000, with appropriate adaptation to the particular situation of each country. By 2005, countries with intermediate mortality levels should aim to achieve an infant mortality rate below 50 deaths per 1,000 and an under-5 mortality rate below 60 deaths per 1,000 births. By 2015, all countries should aim to achieve an infant mortality rate below 35 per 1,000 live births and an under-5 mortality rate below 45 per 1,000."[d]

World Summit for Social Development, 1995: "By the year 2000, reduction of mortality rates of infants and children under five years of age by one third of the 1990 level, or 50 to 70 per 1,000 live births, whichever is less; by the year 2015, achievement of an infant mortality rate below 35 per 1,000 live births and an under-five mortality rate below 45 per 1,000."[e]

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[a] *Report of the United Nations World Population Conference, 1974, Bucharest, 19-30 August 1974* (United Nations publication, Sales No. E.75.XIII.3), chap. I, para. 23.

[b] *Report of the International Conference on Population, 1984, Mexico City, 6-14 August 1984* (United Nations publication, Sales No. E.84.XIII.8 and corrigenda), chap. I, sect. B, recommendation 14.

[c] United Nations Children's Fund, Plan of Action for Implementing the World Declaration on the Survival, Protection and Development of Children in the 1990s, *First Call for Children* (New York, UNICEF, 1990), appendix: Goals for children and development in the 1990s, goal I (a).

[d] *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, para. 8.16.

[e] *Report of the World Summit for Social Development, Copenhagen, 6-12 March 1995* (United Nations publication, Sales No. E.96.IV.8), chap. I, resolution 1, annex II, para. 36 (c).

2. *A global overview of mortality levels in childhood*

Table 5 presents estimated infant mortality levels for the world as a whole and its six major areas for the periods 1970-1975 and 1990-1995 and the percentage change in the levels between those two periods. At the global level, the average infant mortality of 62 deaths per 1,000 live births estimated for 1990-1995 reflects the very disparate experiences of the more developed regions on the one hand and the less developed regions on the other. Thus, whereas out of every 1,000 children born alive in developed countries 11 were expected to die before their first birthday, the corresponding figure for developing countries was 68. Among the latter, countries classified as least developed fared even worse, expecting to lose 109 children out of every 1,000 live births before those children reached age 1. Differences between the major areas of the world are also stark. Thus, whereas in

TABLE 5. INFANT MORTALITY FOR 1970-1975 AND 1990-1995, PERCENTAGE CHANGE IN INFANT MORTALITY BETWEEN THOSE PERIODS, AND UNDER-FIVE MORTALITY FOR 1990-1995, BY MAJOR AREA AND REGION RANKED ACCORDING TO LEVEL OF MORTALITY

Major area or region	*Infant mortality (per 1,000 live births)*		*Percentage change in infant mortality*	*Under-five mortality (per 1,000 live births)*
	1970-1975	*1990-1995*	*1970-1975 to 1990-1995*	*1990-1995*
World	93	62	-33	82
More developed regions	21	11	-50	13
Less developed regions	104	68	-35	90
Least developed countries	147	109	-26	156
Northern America	18	9	-52	10
Europe	25	13	-48	16
Oceania	41	26	-36	33
Latin America and the Caribbean	80	40	-50	46
Asia	98	62	-37	77
Africa	130	94	-28	145

Source: *World Population Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.XIII.5), annex I.

Africa 94 out every 1,000 children born alive were expected to die before age 1 in 1990-1995, in Northern America and Europe the corresponding figures were 9 and 13 respectively. Yet perhaps just as relevant is the range of variation among the developing areas themselves, with Latin America and the Caribbean in 1990-1995 experiencing, on average, an infant mortality level that was 57 per cent lower than Africa's (40 versus 94 deaths per 1,000 births).

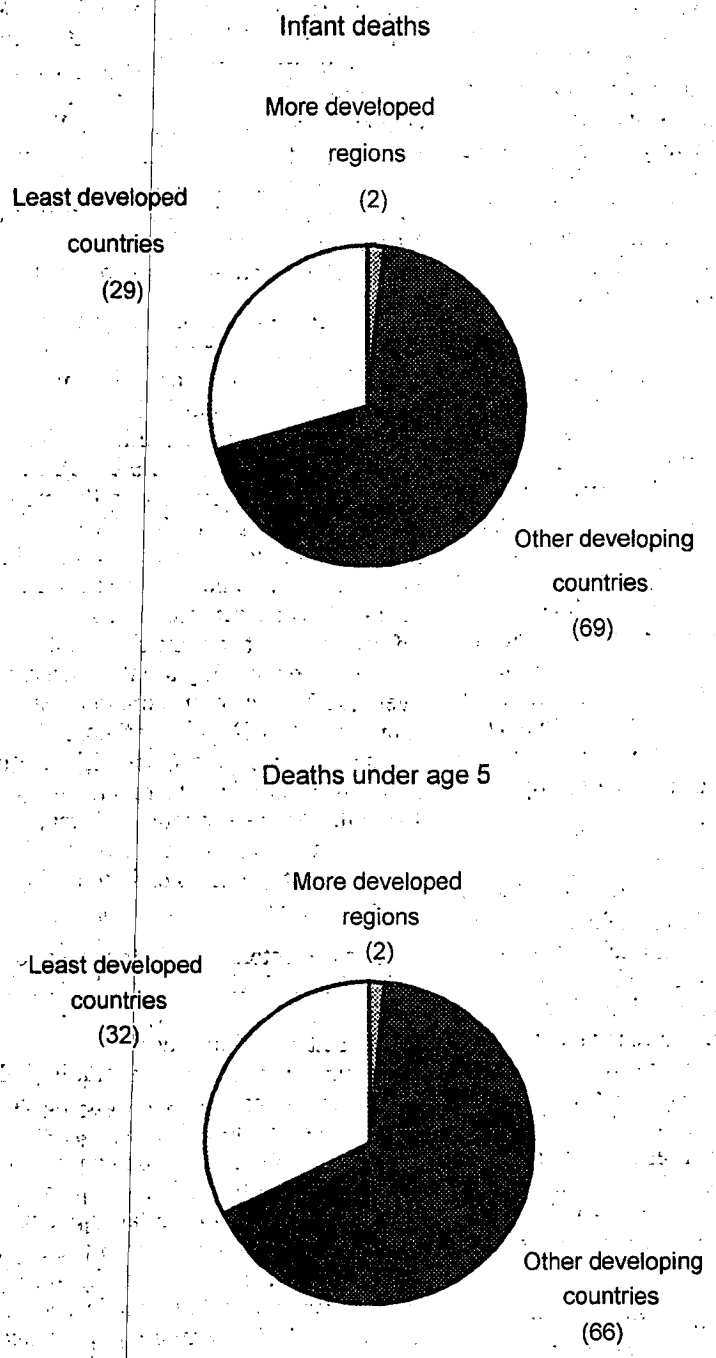
Estimates of under-five mortality, assessing the probability of dying between birth and exact age 5, for 1990-1995 reveal similar differences, though the variation between the high-mortality areas in the developing world and the low-mortality areas in the developed world becomes even more marked, partly because under-five mortality is a more sensitive indicator than infant mortality of the underlying social, environmental and behavioural factors that determine mortality in childhood. As regards under-five mortality, in 1990-1995 the level in Africa was 14.5 times higher than that in Northern America, more than 3 times higher than that in Latin America and the Caribbean, and almost double that in Asia. In fact, estimates by region (see annex table A.2) reveal that Africa contains three of the four regions in the world with an estimated under-five mortality above 100 deaths per 1,000 live births in 1990-1995, namely, Eastern Africa, Middle Africa and Western Africa. The only other region showing a similarly high level of under-five mortality is South-central Asia. Clearly those regions, which encompass most of the least developed countries in the world, deserve priority attention if the low levels of infant and under-five mortality set as goals for the year 2015 are to be achieved.

Yet another reason for focusing mostly on the least developed countries is provided by the distribution of deaths in childhood. Thus, among the estimated 8.2 million infant deaths that occurred in the world in 1990-1995, 2 per cent took place in the more developed regions and 98 per cent in the less developed regions, but the least developed countries, which accounted for 10 per cent of the world's population and 17 per cent of all births, experienced a full 29 per cent of all infant deaths (see figure 5). Similarly, among the estimated 11 million deaths to children aged 0-4 that occurred in 1990-1995, 98 per cent were in the less developed regions and 32 per cent occurred in the least developed countries (figure 5).

The rates of mortality decline also demonstrate that the performance of the less developed countries has not matched that of their more developed counterparts. Thus, as table 5 shows, between 1970-1975 and 1990-1995, infant mortality is estimated to have been reduced by 50 per cent in the more developed regions, 35 per cent in the less developed regions and a low 26 per cent in the least developed countries. At the level of major areas, infant mortality was reduced by about half in Europe, Latin America and the Caribbean, and Northern America, but Africa saw its infant mortality level fall by only 28 per cent, implying an annual rate of decline of 1.4 per cent. If that rate of decline is maintained over the next 20 years, Africa's infant mortality will stand at about 68 deaths per 1,000 births in 2010-2015, a level nearly twice as high as that set by the International Conference on Population and Development in its goal for 2015.

Figure 5. Distribution of infant deaths and deaths under age 5 among more developed regions, the least developed countries and other developing countries, 1990-1995

(Percentage)



Source: *World Population Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.XIII.5), annex 1: Demographic indicators.

3. *Mortality in childhood in developing countries: a review of the evidence*

The striking regional differences discussed above become even more evident when the data at the country level are analysed. The analysis undertaken, however, needs to cope with the scarcity of the data available, particularly for countries characterized by high mortality levels in childhood. Table 6 presents, for each of the major developing areas, the set of countries whose most recent estimate of infant mortality after 1985 was above 100 deaths per 1,000 as well as the list of those countries having an infant mortality below 50 deaths per 1,000 at some point since 1985. The latter group comprises countries that, for all practical purposes, are already within the goals set for the year 2000. The high-mortality group represents countries that, even if they were to sustain from 1995 onwards a rate of decline equivalent to the highest one actually recorded by a member of the group (2.3 per cent per annum), would not be able to reach the goal set for the year 2015.

Just in terms of the number of countries characterized by high levels of infant mortality, Africa dominates over the other regions, with 13 of the 32 countries with data available falling in this category. The number of Asian countries characterized by high infant mortality is lower in relative terms (5 out of the 32 having the required information), but they include two of the most populous countries in the world, namely, Bangladesh and Pakistan. Lastly, in Latin America and the Caribbean only one country, Haiti, belongs to the high-mortality category. It is also interesting to note that all 13 African countries with high infant mortality are designated as "least developed" as well. In Asia, of the five high-mortality countries only Pakistan does not fall into the category of least developed, whereas in Latin America and the Caribbean, Haiti has been classified as least developed.

The magnitude of the problem faced by high-mortality countries is further underscored by their past experience regarding reductions in infant mortality. According to the estimates available within the period 1970-1995, those experiencing the fastest declines in infant mortality have averaged at most a 2.3 per cent reduction annually, a rate that, if maintained, would result in a total reduction of 37 per cent over 20 years and of 50 per cent over 30 years; that is to say, if countries with an infant mortality above 100 per 1,000 in 1985 were subject to the best of past experience, they would see it only halved by 2015 and would therefore fail to reach the level of 35 deaths per 1,000 births established as a goal for that year. These findings corroborate the need to strengthen efforts geared at reducing mortality in infancy in countries that are currently characterized by very high mortality levels.

The results obtained are similar when the focus is on under-five mortality rather than on infant mortality. Table 7 presents for each major area the set of countries with under-five mortality above 150 deaths per 1,000 births for the most recent estimate since 1985 and those with a level below 70 deaths per 1,000 births over the same time-span. The differences between major regions are again marked and consistent with those revealed by infant mortality. If anything, the disadvantaged position of African countries is somewhat more noticeable, since the number of countries in Africa with very high mortality levels for children under age 5 is 16 (out of the 31 countries with data available) and the number with low levels of mortality is 2, compared with the figures of 13 (high-mortality countries) and 3 (low-mortality countries) when infant mortality in Africa is considered. There is some improvement in the position of Asian countries with respect to under-five mortality. Only 3 countries, Bangladesh, the Lao People's Democratic Republic and Pakistan fall in the high-mortality category but 14 in the low-mortality category. A slightly similar trend in the same direction is observed among Latin American and Caribbean countries when under-five mortality is the distinguishing criterion, with the size of the set of high-mortality countries remaining unchanged but that of low-mortality countries becoming smaller. This drop in the number of the low-mortality countries is mainly due to the fact that recent under-five mortality estimates are not available for all countries.

It should be noted, however, that there are a number of countries where improvements in child survival over the past 20 years have been quite impressive: 4 countries in Africa, 13 in Asia and 11 in Latin America and the Caribbean have experienced declines in infant mortality of 4 per cent or more per year (see table 8). Declines are even more impressive when considering the mortality of all children under age 5: 6 countries in Africa, 15 in Asia and 15 in Latin America and the Caribbean had declines of 4 per cent or more per year. Some of those countries, such as China, India and Mexico, represent the most populous in the world. Of particular note among the countries with rapid declines in childhood mortality are those where such declines have averaged 7 per cent or more per year. They include Chile, Jamaica and the Republic of Korea for infant mortality and the same three plus Costa Rica; Hong Kong, China; Mauritius; and Sri Lanka for under-five mortality. Note that for Chile and the Republic of Korea, the rate of decline represents an average over a period of more than 20 years, meaning that the declines in mortality have been not only large but also sustained.

Multiple factors underly the reductions of childhood mortality observed. They include both factors expected to have a direct effect on mortality, such as increased immunization levels, better nutrition and more widespread access to health care, and factors affecting mortality indirectly, such as improvement in maternal education, access to safe water and improved sanitation. Such factors are likely to account for the declines observed both in countries with currently high levels of mortality and in those with lower levels. However, in many of the high-mortality countries, interventions to improve the health and survival chances of children have only recently been accorded high priority and the improvements brought about by such interventions are just starting to take hold. Furthermore, the evidence suggests that the slowdown in the mortality declines experienced by the least developed countries is associated with the growing prevalence of HIV infection and AIDS.

Although HIV infection affects mostly adults between the ages of 15 and 50, children may be exposed to the infection if their mothers are HIV-positive. Mother-to-child transmission of HIV usually occurs during pregnancy, at the time of

TABLE 6. COUNTRIES WITH INFANT MORTALITY LEVELS ABOVE 100 DEATHS PER 1,000 OR BELOW 50 DEATHS PER 1,000, BY REGION AND RANKED BY LEVEL, 1985-1990

Country or area	Infant mortality (per 1,000) 1985	1990	Annual rate of change	Country or area	Infant mortality (per 1,000) 1985	1990	Anual rate of change
Countries with high mortality				*Countries with low mortality*			
AFRICA							
Guinea	151	150	-0.1	Botswana	58	49	-3.7
Liberia	151	..	-1.2	Tunisia	50	49	-5.7
Niger	146	..	..	Mauritius	24	21	-4.7
Malawi	138	134	-1.9				
Burkina Faso	132	128	-0.1				
Rwanda	123	113	-0.4				
Ethiopia	122	..	..				
Uganda	121	..	1.5				
Burundi	113	..	-1.4				
Central African Republic	113	107	-1.5				
Benin	106	101	-2.3				
Togo	100	..	-1.6				
Zambia	99	107	0.1				
ASIA							
Pakistan	..	100	-0.8	Tajikistan	52	45	-0.4
Lao People's Democratic Republic	125	119	-1.0	Philippines	48	34	-3.6
Bangladesh	112	108	-1.6	Uzbekistan	47	41	-1.9
Nepal	108	102	-2.1	Viet Nam	46	44	-2.2
Myanmar	96	103	-0.8	Turkmenistan	45	35	0.6
				Syrian Arab Republic	42	..	-5.4
				Kyrgyzstan	42	30	-1.9
				China	38	33	-5.0
				Jordan	36	..	-5.5
				Thailand	35	29	-5.1
				Kazakhstan	30	26	0.3
				Azerbaijan	29	23	-2.1
				Sri Lanka	26	..	-6.2
				Armenia	25	19	-2.1
				Kuwait	24	..	-4.8
				United Arab Emirates	24	..	-6.2
				Georgia	24	16	-2.2
				Malaysia	17	13	-5.4
				Israel	12	10	-4.8
				Republic of Korea	..	10	-7.1
				Singapore	9	7	-6.2
				Hong Kong, China	8	6	-5.8
LATIN AMERICA AND THE CARIBBEAN							
Haiti	109	105	-2.3	Honduras	55	50	-3.6
				Ecuador	51	39	-5.4
				Mexico	43	39	-4.1
				Colombia	34	28	-4.1
				Venezuela	32	24	-4.0
				Panama	30	27	-3.2
				Uruguay	29	21	-3.7
				Trinidad and Tobago	26	..	-5.0
				Argentina	26	26	-4.0

TABLE 6. (*continued*)

Country or area	Infant mortality (per 1,000) 1985	1990	Annual rate of change	Country or area	Infant mortality (per 1,000) 1985	1990	Annual rate of change
Countries with high mortality				*Countries with low mortality*			
				Chile	19	16	-7.7
				Puerto Rico	..	16	-4.0
				Costa Rica	18	15	-6.0
				Jamaica	17	..	-7.8
				Cuba	15	..	-6.3

Source: Annex tables A.3, A.4 and A.5.

delivery or during breastfeeding. Approximately one third of the children born to HIV-infected women are likely to acquire HIV infection from their mothers (see chap. V of the present publication). Thus it is estimated that deaths among children aged 0-4 are likely to be 9 per cent higher during 1985-2005 than they would have been in the absence of HIV infection (United Nations, 1998e). The Population Division of the United Nations Secretariat has identified 28 countries with at least 1 million population where HIV seroprevalence among adults was 2 per cent or more in 1994 as being those where the AIDS epidemic has advanced far enough to have a significant demographic effect. Among those 28 countries, 24 are in sub-Saharan Africa, 2 in Asia and 2 in Latin America and the Caribbean. For 22 of the 24 countries in sub-Saharan Africa and for Haiti in the Caribbean, data on trends of infant and under-five mortality are available.

For countries with high prevalence of HIV infection, tables 9 and 10 show the annual rates of change of infant mortality and under-five mortality respectively for the whole period covered by the data available for each country and separately for two consecutive component sub-periods, one preceding and including the estimated year of onset of the epidemic, and the other following the year of onset. In all countries, except the Central African Republic, Namibia and Rwanda, the rate of decline of under-five mortality was greater for the first sub-period than for the second. To cite just one example, in Kenya under-five mortality for the whole period 1970-1990 declined at a rate of 2.7 per cent per year; whereas in the period 1970-1980 (1978 was the year widespread transmission of HIV began) the rate of decline was an impressive 4.8 per cent per year, after that — from 1980 to 1990 — under-five mortality declined by only 0.6 per cent per year. In other countries, such as Burundi and Zambia, declines of infant mortality of 2.0 and 1.0 per cent per year have been succeeded and offset by increases of infant mortality amounting to 0.4 and 1.3 per cent per year, respectively. In general, the slowdown in the annual rate of decline of infant mortality after the onset of the AIDS epidemic ranged from a drop of more than 2 percentage points in Burundi, Kenya and Zambia to a drop of less than 1 percentage point in Benin, Botswana, Cameroon, Malawi and Togo. Rwanda remains a puzzle. The widespread transmission of HIV is estimated to have begun in 1977 but the estimates of infant and under-five mortality for Rwanda show an increase in mortality in childhood between 1970 and 1975 and a decline thereafter. In the case of the Central African Republic and Namibia, the rate of decline of infant mortality slows after 1984 (in Namibia there was actually an increase in infant mortality after 1984) but the same trend is not noticeable with regard to under-five mortality. However, despite the trend followed by the estimates for those three countries, the evidence validates the existence of a slowdown in the decline of infant and under-five mortality after the onset of widespread transmission of HIV. These findings underscore the fact that improvements in child health and survival can be seriously undermined by the spread of new or re-emerging infectious diseases. Furthermore, they imply that — especially among the least developed countries where the level of HIV infection is significant — the task of reducing mortality in childhood has become more onerous and may depend not only on programmes aimed at combating the traditional infectious diseases of childhood but also on a concerted effort to prevent the further transmission of HIV.

4. *Infant mortality in countries with economies intransition and in developed countries with established market economies*

In comparison with the levels of mortality experienced by the majority of developing countries, the levels typical of the countries with economies in transition and especially those characterizing the developed countries with established market economies are on the low side. Focusing first on the countries with economies in transition, the estimates of infant mortality available for 1990 indicate that the highest levels were experienced by the successor States of the former USSR located in South-central Asia where infant mortality was at most 45 deaths per 1,000 live births (see tables 11 and 12). Consequently, although the Programme of Action of the International Conference on Population and Development still calls for a one-third reduction of these levels by the year 2000, none of the countries with economies in transition is expected to exceed the less stringent goal of 50 deaths per 1,000 live

TABLE 7. COUNTRIES WITH UNDER-FIVE MORTALITY LEVELS ABOVE 150 DEATHS PER 1,000 OR BELOW 70 DEATHS PER 1,000, BY REGION AND RANKED BY LEVEL, 1985-1990

Country or area	Under-five mortality (per 1,000) 1985	1990	Annual rate of change	Country or area	Under-five mortality (per 1,000) 1985	1990	Annual rate of change
Countries with high mortality				*Countries with low mortality*			
AFRICA							
Niger	334	..	..	Botswana	73	59	-4.7
Guinea	256	254	-2.1	Tunisia	65	64	-6.4
Malawi	246	234	-1.9				
Liberia	226	..	-1.2				
Burkina Faso	212	204	-1.7				
Rwanda	207	188	-0.5				
Ethiopia	205	..	..				
Uganda	203	..	0.4				
Madagascar	195	163	-0.2				
Nigeria	192	..	-0.4				
Central African Republic	189	160	-1.9				
Burundi	188	..	-1.5				
Benin	174	166	-2.5				
Togo	164	..	-1.8				
Zambia	162	191	0.5				
Côte d'Ivoire	150	150	-1.6				
ASIA							
Pakistan	..	152	-0.9	Philippines	71	54	-3.6
Lao People's Democratic Republic	185	175	-1.1	Iraq	68	..	-3.3
Bangladesh	164	166	-1.9	Viet Nam	55	55	-4.0
				Syrian Arab Republic	53	..	-6.2
				China	48	42	-5.7
				Thailand	45	35	-5.8
				Jordan	44	..	-6.5
				Sri Lanka	32	..	-7.0
				Kuwait	29	..	-5.3
				United Arab Emirates	29	..	-6.9
				Malaysia	23	17	-6.5
				Republic of Korea	..	13	-7.1
				Israel	14	12	-4.5
				Hong Kong, China	9	8	-7.3
LATIN AMERICA AND THE CARIBBEAN							
Haiti	158	152	-2.5	Honduras	74	65	-4.1
				Dominican Republic	71	..	-4.3
				Ecuador	67	49	-6.1
				Mexico	55	48	-4.9
				Colombia	47	36	-5.0
				Panama	40	36	-4.1
				Venezuela	39	..	-4.3
				Uruguay	33	..	-4.6
				Trinidad and Tobago	30	..	-5.2
				Jamaica	20	..	-8.5
				Cuba	19	..	-5.9
				Puerto Rico	..	18	-2.9

Source: Annex tables A.3, A.4 and A.5.

births by the end of the century. Nevertheless, it is important to analyse trends in infant mortality in those countries because the evidence suggests that, with respect to adult mortality, countries with economies in transition have tended to experience either outright declines in the probabilities of survival or only minor improvements over the past 20 or 30 years, especially among men aged 30 - 49 (Anderson and Silver, 1989a and 1989b; Eberstadt, 1993; Nanda and others, 1993; United Nations Children's Fund, 1994; Bobak, 1997). The issue to be explored is therefore whether infant mortality has also shown signs of stagnation or deterioration over time.

Table 11 presents data allowing the assessment of trends of infant mortality among the successor States of the former USSR. Among the successor States, seven are considered to be part of Europe; and eight are classified as being in Asia, with Armenia, Azerbaijan and Georgia being part of Western Asia and the rest being grouped with South-central Asia. On the whole, the South-central Asian successor States have tended to have higher infant mortality levels than the successor States in either Europe or Western Asia. In fact, by 1990 only the South-central Asian successor States and Azerbaijan had an infant mortality above 20 deaths per 1,000 births.

When trends over time are considered, it is striking that for most of the successor States, the estimates of infant mortality available suggest that mortality increased between 1970 and 1975. In the cases of the Republic of Moldova, Turkmenistan and Uzbekistan, the increase recorded is marked, amounting to at least 20 deaths per thousand. Although the increases were small or moderate in all other States, they nevertheless suggest that some kind of consistent change was at the root of all of them. Those analysing this trend have concluded that the increases recorded were mostly the result of changes in the registration and certification procedures for perinatal deaths, especially after the introduction of a Certificate of Perinatal Death in 1974 (Anderson and Silver, 1994). Willekens and Scherbov (1995) confirm that such a source of bias was important in the case of the Russian Federation where much of the increase in infant mortality recorded between 1970 and 1975 could be attributed to rising neonatal mortality. When one disregards the spurious increase between 1970 and 1975, the general trend portrayed by the rest of the estimates between 1975 and 1990 is downward. Thus, for most successor States the annual rate of decline of infant mortality during that period was of at least 2.5 per cent per year and in the cases of Georgia, Lithuania, the Republic of Moldova and Uzbekistan the rate of decline was sufficiently high to ensure that infant mortality levels were cut by half between 1975 and 1990. However, as of 1990 a change of trend is noticeable. As figure 6 illustrates, annual estimates of infant mortality for Armenia, Azerbaijan and most of the European successor States have been varying over narrow ranges and showing a tendency towards stagnation rather than decline, especially over the period 1990-1995. For the five countries with estimates for 1996, those estimates are lower than the ones for 1995. In the Asian successor States of Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan, trends have been mixed, with Uzbekistan registering a significant decline since 1990, Tajikistan since 1992 and the other two experiencing fluctuating levels indicative of stagnation. On the whole, therefore, infant survivorship in most of the successor States of the former USSR has failed to show consistent or noticeable improvements during 1990-1995.

Regarding the other countries with economies in transition, table 12 displays estimates of infant mortality for the 19 countries located in Europe. In general, the European countries with economies in transition are characterized by fairly low levels of infant mortality (below 20 deaths per 1,000 births in at least two thirds of the countries considered) and by the maintenance of a declining trend. Several countries—Belarus, Bulgaria, Estonia, Latvia, Lithuania, Poland, the Republic of Moldova, Romania, the Russian Federation and Ukraine—show some evidence of an increase or stagnation of infant mortality over the period 1985-1995, but the increases recorded are small in absolute terms. Furthermore, the most recent data available suggest that declines have resumed in Estonia, Latvia, Lithuania, Poland, the Republic of Moldova and Romania. Therefore, these data lend scant support to the expectation that infant mortality in the countries with economies in transition would be subject to deteriorating trends similar to those of mortality at older ages; that is to say, the decline in life expectancy registered in a number of countries with economies in transition seems to have arisen mainly from reduced probabilities of survival at adult ages rather than from rises in the chance of dying in infancy. However, the data available do not permit as yet the tracing of a full picture and there is no guarantee that mortality in childhood will, despite the societal and institutional changes that may be causing increases in mortality among adults, keep on decreasing.

Turning now to developed countries with established market economies, we note that most have reached levels of infant mortality that may be close to the limit possible in human populations. Table 13 shows that, in 1995, Greece, Portugal and the United States of America experienced the highest infant mortality level among members of the group, amounting to 8 deaths per 1,000 live births. With the further exception of New Zealand, which recorded an infant mortality of 7 deaths per 1,000, all other developed countries had a level of at most 6 deaths per 1,000. The lowest level recorded so far is that of Sweden whose population in 1996 experienced only 3 deaths in infancy per every 1,000 live births. When current levels are compared with those prevailing in 1980, it is clear that most countries have managed to reduce their infant mortality by significant amounts: out of the 21 countries considered, 9 recorded a reduction of 50 per cent or more. However, the lower the level of infant mortality recorded in 1980, the smaller in relative terms the reductions tended to be; that is to say, as mortality reaches its biological limits, the likelihood and pace of further reductions diminish. Therefore, an intriguing question is how much further infant mortality can be reduced. The answer depends on the role that technology and medical progress may play in combating the biological factors that probably account for most of the infant deaths in countries with very low infant mortality. There is evidence, however, that socio-economic factors still play a role in determining a significant proportion of infant deaths in advanced societies. In the United States, for instance, socially disadvantaged groups have an infant mortality that is significantly higher than the national average. Large child mortality differentials by socio-economic status

TABLE 8. COUNTRIES WITH AN ANNUAL RATE OF CHANGE OF INFANT OR UNDER-FIVE MORTALITY OF (-4) PER CENT OR LESS,[a] BY REGION, 1969-1996

Region and country or area	Infant mortality: Period	Infant mortality: Annual rate of change	Region and country or area	Under-five mortality: Period	Under-five mortality: Annual rate of change
AFRICA					
Tunisia	1970-1987	-5.7	Mauritius	1972-1983	-9.2
Egypt	1970-1990	-4.7	Tunisia	1970-1987	-6.4
Mauritius	1972-1995	-4.7	Algeria	1970-1985	-5.4
Algeria	1970-1985	-4.2	Egypt	1970-1990	-5.2
			Botswana	1969-1989	-4.7
			Mauritania	1972-1977	-4.4
ASIA					
Republic of Korea	1969-1991	-7.1	Hong Kong, China	1971-1990	-7.3
Singapore	1970-1996	-6.2	Republic of Korea	1969-1991	-7.1
Sri Lanka	1970-1984	-6.2	Sri Lanka	1970-1984	-7.0
United Arab Emirates	1972-1986	-6.2	United Arab Emirates	1972-1986	-6.9
Hong Kong, China	1971-1995	-5.8	Jordan	1970-1985	-6.5
Jordan	1970-1985	-5.5	Malaysia	1970-1989	-6.5
Malaysia	1970-1996	-5.4	Syrian Arab Republic	1970-1984	-6.2
Syrian Arab Republic	1970-1984	-5.4	Iran, Islamic Republic of	1971-1984	-6.0
Iran, Islamic Republic of	1971-1984	-5.1	Thailand	1969-1988	-5.8
Thailand	1969-1988	-5.1	China	1970-1988	-5.7
China	1970-1988	-5.0	Singapore	1970-1980	-5.5
Israel	1970-1993	-4.8	Kuwait	1969-1984	-5.3
Kuwait	1969-1984	-4.8	Israel	1970-1988	-4.5
			India	1979-1988	-4.0
			Viet Nam	1981-1991	-4.0
LATIN AMERICA AND THE CARIBBEAN					
Jamaica	1975-1986	-7.8	Jamaica	1975-1986	-8.5
Chile	1969-1995	-7.7	Costa Rica	1969-1980	-7.4
Cuba	1970-1996	-6.3	Chile	1969-1980	-7.3
Costa Rica	1969-1994	-6.0	Ecuador	1970-1989	-6.1
Ecuador	1970-1989	-5.4	Cuba	1970-1985	-5.9
Trinidad and Tobago	1971-1984	-5.0	Trinidad and Tobago	1971-1984	-5.2
Mexico	1970-1988	-4.1	Colombia	1969-1992	-5.0
Colombia	1969-1992	-4.1	Argentina	1970-1980	-5.0
Argentina	1970-1995	-4.0	Mexico	1970-1988	-4.9
Puerto Rico	1970-1994	-4.0	Uruguay	1975-1985	-4.6
Venezuela	1970-1990	-4.0	Peru	1970-1989	-4.4
			Dominican Republic	1969-1985	-4.3
			Venezuela	1970-1984	-4.3
			Honduras	1973-1989	-4.1
			Panama	1970-1989	-4.1

Source: Annex tables A.3, A.4 and A.5.
[a] Rate of decline of 4 per cent or more.

are also common in developing countries. Aware of the existence of those differentials and the importance of reducing them, the Programme of Action of the International Conference on Population and Development calls for the reduction of "disparities between and within developed and developing countries as quickly as possible" (United Nations, 1995a, chap. I, resolution 1, annex, para. 8.15 (a)). Another type of differential that is also given prominent attention in the Programme of Action is that between the sexes. In developed countries, mortality of infants and children is consistently higher among males than among females. This is not always the case in developing countries. The following subsection summarizes our current knowledge about sex differentials in infant and child mortality among developing countries.

5. *Sex differentials in childhood mortality in developing countries*

The plight of the girl child is a significant research and policy issue. The World Declaration on the Survival, Protection and Development of Children (United Nations Children's Fund, 1990) adopted at the World Summit for Children in 1990 and the Programme of Action of the International Conference on Population and Development adopted in 1994 call for efforts "to eliminate all forms of discrimination against the girl child" (United Nations, 1995a, chap.I, resolution 1, annex, para. 4.16 (a)). In particular, the Programme of Action calls for the elimination of excess mortality of girls where such a pattern exists and for special education and public information efforts to promote equal treatment of girls and boys with respect to nutrition and health care (United Nations, 1995a, chap. I, resolution 1, annex, para. 4.17). In order to identify measures aimed at eliminating the excess and preventable mortality among young girls, a study of the sex differentials in infant, child and under-five mortality and the specific mechanisms that may lead to excess female mortality was undertaken (see United Nations, 1998d). Among other things, the study identifies the regions and countries in which girls are disadvantaged relative to boys in terms of mortality and explores whether the magnitude of such excess mortality, where it exists, has changed over the past 25 years. The main findings from that study are summarized below, focusing especially on estimates of child mortality by sex, that is to say, mortality between the exact ages of 1 and 5 (in other words, among children aged 1-4).

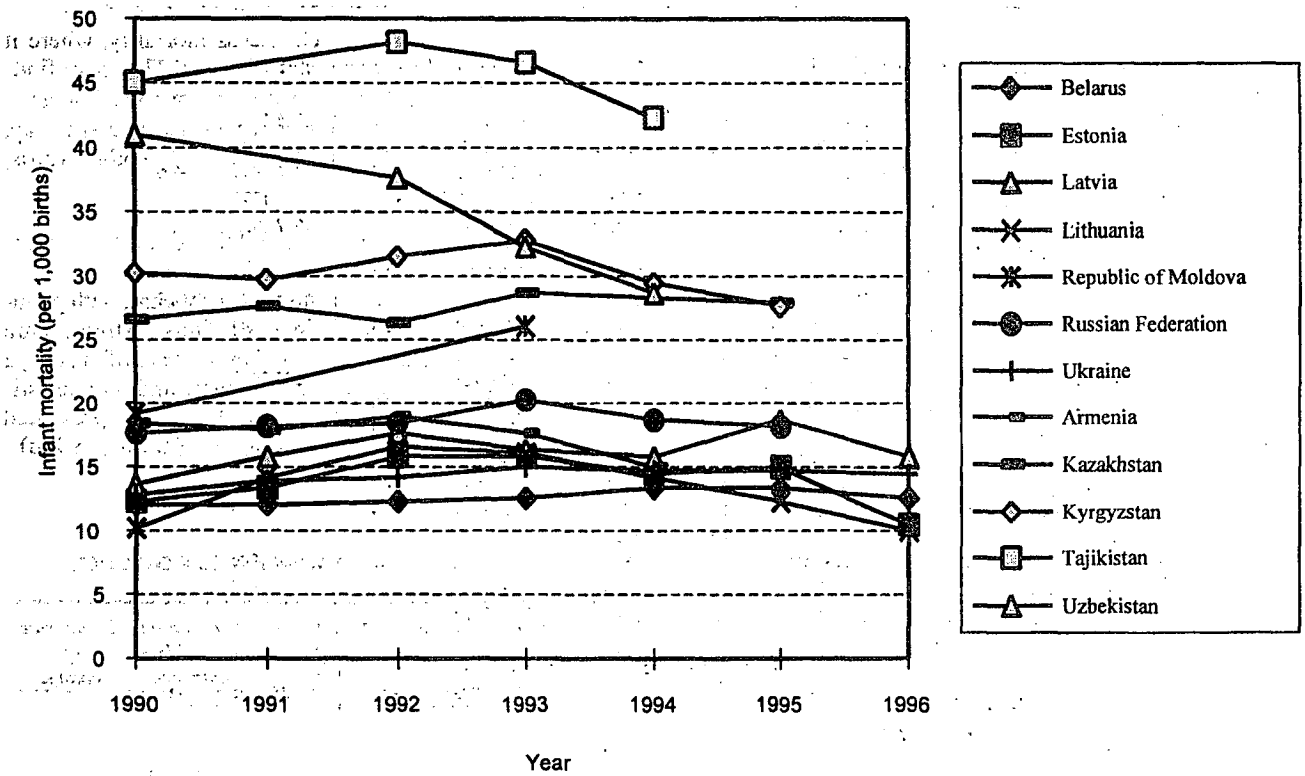
Sex differentials in infant and childhood mortality were estimated for 82 developing countries (34 in Africa, 25 in Asia and 23 in Latin America and the Caribbean), with populations in excess of 1 million in 1990. Those estimates are presented in annex tables A.7-A.9. For the sake of brevity, a description of the data used to derive male and female estimates of infant and under-five mortality is not presented but is available in the full report (United Nations, 1998d).

TABLE 9. ANNUAL RATE OF CHANGE OF INFANT MORTALITY FOR COUNTRIES WITH HIGH PREVALENCE OF HIV INFECTION

Region and country or area	*Period with infant mortality estimates*	*Annual rate of change*	*Starting year of HIV epidemic*	*Period before start of HIV epidemic*	*Annual rate of change*	*Period after start of HIV epidemic*	*Annual rate of change*
			AFRICA				
Benin	1970-1988	-2.3	1981	1970-1985	-2.5	1985-1988	-1.6
Botswana	1969-1989	-3.7	1982	1969-1984	-3.8	1984-1989	-3.4
Burkina Faso	1970-1988	-0.1	1982	1970-1984	-1.5	1984-1988	-0.8
Burundi	1969-1984	-1.4	1977	1969-1980	-2.0	1980-1984	0.4
Cameroon	1971-1990	-2.4	1982	1971-1984	-2.5	1984-1990	-2.1
Central African Republic	1970-1992	-1.5	1981	1970-1984	-1.9	1984-1992	-0.7
Côte d'Ivoire	1975-1992	-2.4	1981	1975-1987	-2.9	1987-1992	-1.1
Democratic Republic of the Congo[a]	1970-1979	-1.6	1980	1970-1979	-1.6	..	..
Eritrea	1984-1994	-0.9	1983	..	..	1984-1994	-0.9
Kenya	1970-1990	-2.4	1978	1970-1980	-3.7	1980-1990	-1.1
Lesotho	1969-1983	-2.3	1983	1969-1983	-2.3	..	..
Malawi	1970-1990	-1.9	1979	1970-1980	-2.3	1980-1990	-1.5
Mozambique	1969-1975	0.0	1980	1969-1975	0.0	..	..
Namibia	1979-1988	-0.6	1982	1979-1984	-1.4	1984-1988	0.4
Rwanda	1969-1990	-0.4	1977	1969-1979	0.4	1979-1990	-1.2
Sierra Leone	1969-1980	-1.0	1981	1969-1980	-1.0	..	..
Tanzania, United Republic of	1969-1989	-1.6	1977	1969-1979	-2.2	1979-1989	-1.0
Togo	1968-1984	-1.6	1981	1968-1980	-1.8	1980-1984	-1.2
Uganda	1980-1984	1.5	1977	..	..	1980-1984	1.5
Zambia	1970-1989	0.1	1979	1970-1980	-1.0	1980-1989	1.3
Zimbabwe	1975-1990	-2.5	1981	1975-1979	-1.7	1986-1990	-0.5
			LATIN AMERICA AND THE CARIBBEAN				
Haiti	1969-1988	-2.3	1980	1969-1985	-2.5	1985-1988	-1.2

Source: Annex tables A.3 and A.5.
[a]Formerly Zaire.

Figure 6. Infant mortality in the successor States of the former USSR, 1990-1996



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

In most populations, female infants have lower mortality than their male counterparts, an outcome that is attributed to biological and genetic factors. The female advantage also operates beyond infancy, although at some point during early childhood environmental rather than biological factors begin to have a greater influence in determining sex differentials in mortality (Makinson, 1994; Waldron, 1983 and 1987). Because a large proportion of mortality under age 5 is concentrated in the first year of life, when mortality due to endogenous causes prevails, the sex differential of under-five mortality generally favours girls. In some developing countries, the advantage girls have over boys is far outweighed by other factors, including discriminatory child-care practices favouring boys that lead to excess female mortality among children, particularly between exact ages 1 and 5 (Arnold, 1992; and Tabutin and Willems, 1995).

Among the 82 countries considered, those in South-central Asia and, to a lesser extent, those in Northern Africa and Western Asia stand out as having unexpectedly high mortality of females aged 1-4 relative to that of males in the same ages group. Among countries in South-central Asia, girls aged 1-4 have 16 per cent higher mortality than boys of the same age; and in countries in Northern Africa and Western Asia the magnitude of excess mortality among girls is 11 per cent (see table 14). In South-central Asia, all 12 estimates available show that the mortality of girls exceeds that of boys. The most pronounced excess female mortality is found in Bangladesh, India and Nepal during the 1980s. In these three countries, girls aged 1-4 are 20 to 30 per cent more likely to die than boys in the same age group. In India and Nepal, evidence of unexpectedly high risks of death among females is also found in infancy, that is, among children under age 1 (see annex table A.8), a finding that further reinforces the case for the existence of female disadvantage.

In Northern Africa and Western Asia, excess female mortality appears to be most severe (15 per cent or higher) in Egypt, Oman, the Syrian Arab Republic and Yemen. In the case of Oman and the Syrian Arab Republic, however, the most recent estimates available date from the 1970s. Estimates for Egypt and the Syrian Arab Republic also show evidence of female disadvantage in infancy (annex tables A.7 and A.8).

The pattern of results for the three other major developing regions is broadly uniform. The countries experiencing higher mortality of females in relation to that of male children fail to display clear-cut geographical patterns. In both sub-Saharan

TABLE 10. ANNUAL RATE OF CHANGE OF UNDER-FIVE MORTALITY FOR COUNTRIES WITH HIGH PREVALENCE OF HIV INFECTION

Region and country or area	*Period with under-five mortality estimates*	*Annual rate of change*	*Starting year of HIV epidemic*	*Period before start of HIV epidemic*	*Annual rate of change*	*Period after start of HIV epidemic*	*Annual rate of change*
			AFRICA				
Benin	1970-1988	-2.5	1981	1970-1985	-2.7	1985-1988	-1.6
Botswana	1969-1989	-4.7	1982	1969-1984	-4.9	1984-1989	-4.3
Burkina Faso	1970-1988	-1.7	1982	1970-1984	-1.9	1984-1988	-1.0
Burundi	1969-1984	-1.5	1977	1969-1980	-2.1	1980-1984	0.3
Cameroon	1971-1990	-2.7	1982	1971-1984	-2.7	1984-1990	-2.6
Central African Republic	1970-1992	-1.9	1981	1970-1984	-1.9	1984-1992	-2.1
Côte d'Ivoire	1975-1992	-1.6	1981	1975-1987	-2.3	1987-1992	0.0
Democratic Republic of the Congo[a]	1970-1979	-2.2	1980	1970-1979	-2.2	..	..
Eritrea	1984-1994	-2.4	1983	..	..	1984-1989	-2.2
Kenya	1970-1990	-2.7	1978	1970-1980	-4.8	1980-1990	-0.6
Lesotho	1969-1983	-2.1	1983	1969-1983	-2.1	..	..
Malawi	1970-1990	-1.9	1979	1970-1985	-2.2	1985-1990	-1.0
Mozambique	1969-1975	0.0	1980	1969-1975	0.0	..	..
Namibia	1979-1988	-1.9	1982	1979-1984	-1.5	1984-1988	-2.3
Rwanda	1969-1990	-0.5	1977	1969-1979	0.4	1979-1990	-1.3
Sierra Leone	1969-1980	-1.1	1981	1969-1980	-1.1	..	..
Tanzania, United Republic of	1969-1989	-1.7	1977	1969-1979	-2.3	1979-1989	-1.1
Togo	1968-1984	-1.8	1981	1968-1980	-2.0	1980-1984	-1.3
Uganda	1980-1984	0.4	1977	..	..	1980-1984	0.4
Zambia	1970-1989	0.5	1979	1970-1980	-1.1	1980-1989	2.3
Zimbabwe	1975-1990	-2.9	1981	1975-1979	-1.9	1986-1990	-0.6
			LATIN AMERICA AND THE CARIBBEAN				
Haiti	1969-1988	-2.5	1980	1969-1985	-2.7	1985-1988	-1.3

Source: Annex tables A.3 and A.5.
[a]Formerly Zaire.

TABLE 11. INFANT MORTALITY ESTIMATES FOR THE SUCCESSOR STATES OF THE FORMER USSR, 1970-1996

Successor States	*Infant mortality (per 1,000)*							*Percentage change 1975-1995*	*Annual rate of change 1975-1995*
	1970	*1975*	*1980*	*1985*	*1990*	*1995*	*1996*		
Europe									
Belarus[a]	19	19	16	15	12	13	13	-32	-1.9
Estonia	18	18	17	14	12	15	11	-17	-0.9
Latvia	18	20	15	13	14	19	16	-5	-0.3
Lithuania	19	20	15	14	10	13	10	-35	-2.2
Republic of Moldova[a]	23	43	35	31	19	22	20	-49	-3.4
Russian Federation[a]	23	24	22	21	18	18	..	-25	-1.4
Ukraine[a]	17	20	17	16	13	15	15	-25	-1.4
Western Asia									
Armenia[a]	25	31	26	25	19	..	..	-39[a]	-3.3[b]
Azerbaijan[a]	35	38	30	29	23	..	..	-39[a]	-3.4[b]
Georgia[a]	25	33	25	24	16	..	..	-52[a]	-4.8[b]
South-central Asia									
Kazakhstan[a]	26	39	33	30	26	28	..	-28	-1.7
Kyrgyzstan[a]	45	43	43	42	30	28	..	-35	-2.1
Tajikistan[a]	46	57	54	52	45	..	..	-21[a]	-1.6[b]
Turkmenistan[a]	31	54	47	45	35	..	..	-35[a]	-2.9[b]
Uzbekistan[a]	46	81	58	47	41	..	..	-49[a]	-4.5[b]

Source: United Nations Statistics Division, Department of Economic and Social Affairs of the United Nations Secretariat.
[a]Data excluding infants born alive after less than 28 weeks' gestation, of less than 1,000 grams in weight and 35 centimetres in length who die within seven days of birth.
[b]Change over 1975-1990.

TABLE 12. INFANT MORTALITY IN COUNTRIES WITH ECONOMIES IN TRANSITION, 1980-1996, RANKED ACCORDING TO LEVEL IN 1990

Country	Infant mortality (per 1,000)				
	1980	1985	1990	1995	1996
The former Yugoslav Republic of Macedonia	54	43	32	23	..
Albania	..	30	28	..	..
Romania	29	26	27	21	..
Yugoslavia	..	33	23	16	14
Poland	21	18	19	14	12
Republic of Moldova	35	31	19	22	20
Russian Federation	22	21	18	18	..
Bosnia and Herzegovina	..	..	15	..	..
Hungary	23	20	15	11	11
Bulgaria	20	15	15	15	..
Latvia	15	13	14	19	16
Ukraine	17	16	13	15	15
Estonia	17	14	12	15	11
Belarus	16	15	12	13	13
Slovakia	..	16	12	11	10
Croatia	21	17	11	9	..
Lithuania	15	14	10	13	10
Slovenia	..	13	8	6	5
Czech Republic	12	11	7	6	6

Source: Annex table A.6.

Africa and Latin America and the Caribbean, the number of estimates indicating higher mortality among males aged 1-4 than among females aged 1-4 is slightly greater than the number showing higher mortality among females. The countries showing the higher mortality among females tend to cluster in Central America (including Mexico) and Western and Central Africa. In Eastern and South-eastern Asia, the only countries that record marked (more than 10 per cent) excess female mortality among those aged 1-4 are China in the 1980s and the Philippines in the 1970s. In 1985, China had 13 per cent higher mortality among females aged 1-4 than among their male counterparts. For all three developing regions, sub-Saharan Africa, Latin American and Eastern and South-eastern Asia, the median sex ratio ranges between 101 and 105 male deaths between exact ages 1 and 5 per 100 female deaths (see table 14).

Although the evidence points to the existence of marked excess female mortality in only a small number of developing countries which include China and most of which are located in South-central Asia, Northern Africa and Western Asia, this relative geographical concentration should not be allowed to conceal the fact that, in terms of the size of population affected, the problem of female disadvantage has a major impact on the world's population because the countries of South-central Asia and China alone contain half of the world's population. Consequently, existing levels of excess female mortality are estimated to result every year in about 250,000 preventable deaths among girls under age 5.

Estimates of sex-specific mortality for both the 1970s and the 1980s are available for a total of 52 developing countries. Although a decade is rather a short period in which to expect appreciable changes in the relative survival of males and females, large declines in overall under-five mortality were recorded in many developing countries during this period. These gains in child survival may have favoured one sex more than the other and, consequently, shifts in ratios of male to female mortality may be anticipated. For all 52 countries, the overall picture changes little between the 1970s and the 1980s (table 15). The median sex ratio of male to female deaths in infancy increased marginally from 118 to 119, as did the median sex ratio of child deaths between exact ages 1 and 5 from 100 to 101. Disaggregation of these trends by region shows that male-to-female ratios in infant mortality increased in all regions except in Eastern and South-eastern Asia. Thus in most regions the gap between male and female infant mortality appears to be widening gradually in favour of females.

In the countries of Northern Africa and Western Asia for which relevant estimates are available, the trend estimates suggest an improvement of the relative survival of females. Thus the median sex ratio of child mortality rose from 93 in the 1970s to 101 in the 1980s indicating that the 7 per cent excess female mortality in the earlier period had disappeared in the 1980s. Out of the 10 countries in that region, 7 experienced an improvement in the survival chances of females relative to the improvement experienced by males. In one

TABLE 13. TRENDS OF INFANT MORTALITY FOR ESTABLISHED MARKET ECONOMY COUNTRIES WITH INFANT MORTALITY BELOW 10 DEATHS PER 1,000 IN RECENT PERIODS, 1980-1996

Country or area	Infant mortality (per 1,000)					Percentage change
	1980	1985	1990	1995	1996	(1980-1995)
Australia	11	10	8	6	..	-47
Austria	14	11	8	5	5	-62
Belgium	12	9	8	6	6	-50
Canada	10	8	7	6	..	-42
Denmark	8	8	7	5	6	-40
Finland	8	6	6	4	..	-48
France	10	8	7	5	5	-54
Germany	12	9	7	5	..	-57
Greece	18	14	10	8	8	-55
Ireland	11	9	8	6	6	-43
Italy	15	11	9	6	6	-58
Japan	8	6	5	4	..	-43
Netherlands	9	8	7	5	5	-36
New Zealand	13	11	8	7	..	-48
Norway	8	8	7	4	..	-50
Portugal	24	18	11	8	7	-69
Spain	12	9	8	6	5	-55
Sweden	7	7	6	5	3	-30
Switzerland	9	7	7	5	5	-44
United Kingdom	12	9	8	6	6	-49
United States	13	11	9	8	..	-40

Source: Annex table A.6.

case, no change was observed and in two cases a relative deterioration was recorded. These figures constitute powerful evidence that the survival of girls increased more than that of boys between the 1970s and the 1980s in Northern Africa and Western Asia. Evidence from other analyses suggests that this trend marks a continuation of a long-standing relative improvement in the health and welfare of girls.

Trends in South-central Asia appear to have taken a different direction. Among the five countries of this region for which the relevant data are available, an 11 per cent excess female child mortality in the 1970s had deepened into a 22 per cent excess in the 1980s. Examination of the estimates for individual countries reveals considerable variation (table 16). Thus, whereas in Pakistan and Sri Lanka the relative survival chances of girls in childhood appear to have improved between the 1970s and the 1980s, in Bangladesh, India and Nepal the survival chances of girls worsened relative to those of boys. The result for India is particularly striking and important because of its large population. In the 1970s excess female mortality among children between aged 1-4 was estimated at 11 per cent, but by the 1980s the excess had increased to 28 per cent.

B. CHILD HEALTH

Aside from setting goals for the reduction of mortality in infancy and childhood, the 1990 World Summit for Children paid particular attention to measures directed at reducing malnutrition and disease among children. It thus established that by the year 2000 (United Nations Children's Fund, 1990, part one, appendix):

(*a*) The 1990 prevalence of malnutrition should be halved;

(*b*) That ninety per cent of children under the age of one should be immunized against the major preventable diseases;

(*c*) Polio and neonatal tetanus should be eradicated;

(*d*) The number of cases of measles should be reduced by 90 per cent and deaths due to measles should be reduced by 95 per cent;

(e) Deaths in childhood because of diarrhoea should be halved;

(*f*) Childhood deaths because of acute respiratory infections should be reduced by one third.

TABLE 14. MEDIAN SEX RATIOS OF INFANT, CHILD AND UNDER-FIVE MORTALITY AND WEIGHTED AVERAGE SEX RATIOS INDICATING SEX DIFFERENTIALS, BY REGION, 1970S AND 1980S

	Median sex ratios (per 100)			*Weighted average sex ratios (per 100)*		
	Infant mortality	*Child mortality*	*Under-five mortality*	*Infant mortality*	*Child mortality*	*Under-five mortality*
Sub-Saharan Africa	116	101	109	113	103	109
Northern Africa and Western Asia	111	93	104	109	89	102
Eastern and South-eastern Asia	123	104	117	115	98	110
South-central Asia	108	86	103	102	84	95
Latin America and the Caribbean	123	105	119	124	101	117
All developing regions	118	100	110	108	91	102
All developing regions (excluding China)	..	..	..	117	97	109

Source: Annex tables A.7, A.8 and A.9.

Access to safe water and adequate sanitation for all communities was also seen as a major goal to enhance both the development process and the promotion of health for all. The Programme of Action of the International Conference on Population and Development also singled out child health as one of the priority areas for action. Without setting specific goals, the Programme of Action reiterated that "all countries should give priority to efforts to reduce the major childhood diseases, particularly infectious and parasitic diseases, and to prevent malnutrition among children, especially the girl child, through measures aimed at eradicating poverty and ensuring that all children live in a sanitary environment and by disseminating information on hygiene and nutrition" (United Nations, 1995a, chap. VIII, para. 8.17).

The present section presents a review of how 47 developing countries are faring with respect to the priority areas by focusing specifically on the nutritional status of children, the degree of immunization coverage, and the prevalence and treatment of diarrhoea on the one hand and of acute respiratory infection and fever on the other. The countries considered are those where surveys were conducted between 1986 and 1996 under the aegis of the Demographic and Health Surveys (DHS) programme. Those surveys generally gather information on health indicators in childhood by using a standard set of questions. Although they provide a wealth of information regarding health, the focus in this section will be restricted to a small set of indicators. To the extent possible, comparability of the indicators between

TABLE 15. MEDIAN SEX RATIOS OF INFANT, CHILD AND UNDER-FIVE MORTALITY FOR VARIOUS MEASURES OF MORTALITY IN CHILDHOOD, BY REGION, 1970S AND 1980S

		Median sex ratios (per 100)					
	Number of countries	*Infant mortality*		*Child mortality*		*Under-five mortality*	
		1970s	*1980s*	*1970s*	*1980s*	*1970s*	*1980s*
Sub-Saharan Africa	12	114	117	101	104	110	111
Northern Africa and Western Asia	10	109	114	93	101	102	107
Eastern and South-eastern Asia	7	125	122	100	102	120	120
South-central Asia	5	113	116	89	78	100	101
Latin America and the Caribbean	18	123	124	107	103	118	121
All developing regions	52	118	119	100	101	111	114

Source: Annex tables A.7, A.8 and A.9.

TABLE 16. CHANGES IN THE SEX RATIO OF CHILD MORTALITY, $_4q_1$, FOR SELECTED COUNTRIES FROM THE 1970S TO THE 1980S

	1970s		*1980s*	
	Reference date	*Sex ratio of $_4q_1$*	*Reference date*	*Sex ratio of $_4q_1$*
Northern Africa				
Algeria	1975	93	1985	94
Egypt	1975	78	1985	83
Libyan Arab Jamahiriya	1975	94	..	..
Morocco	1972	90	1985	90
Tunisia	1975	94	1983	100
Sudan	1973	97	1985	107
South-central Asia				
Afghanistan	1978	98	..	..
Bangladesh	1970	85	1985	76
Bhutan	1983	99	..	..
India	1977	89	1985	72
Nepal	1970	92	1985	78
Pakistan	1975	81	1985	90
Sri Lanka	1975	91	1985	96
Western Asia				
Israel	1975	110	1985	105
Iraq	1973	112	..	..
Jordan	1970	97	1985	102
Kuwait	1975	105	1983	129
Oman	1978	73	..	..
Syrian Arab Republic	1972	85	..	..
Turkey	1973	78	1988	109
Yemen	1975	91	1987	85

Source: Annex tables A.7, A.8 and A.9.

countries has been maintained, with the result that for certain indicators the data for specific countries had to be excluded. In what follows, attention will be focused on the differences in respect of health indicators between three distinct regions of the developing world: (*a*) sub-Saharan Africa; (*b*) Northern Africa and Asia; and (*c*) Latin America and the Caribbean. Given the regional coverage achieved by the 47 DHS surveys the number of countries considered, in Northern Africa and Asia as well as in Latin America and the Caribbean tends to be small. Because of the constraints imposed by such small numbers, it was not possible to consider separately specific subregions of Asia or even to separate Northern Africa and Western Asia from the rest of Asia. The decision to consider Northern Africa together with the whole of Asia instead of considering it jointly with sub-Saharan Africa was based on the cultural, socio-economic and health-related similarities between the countries covered in Northern Africa and those in Western Asia.

1. *Nutritional status*

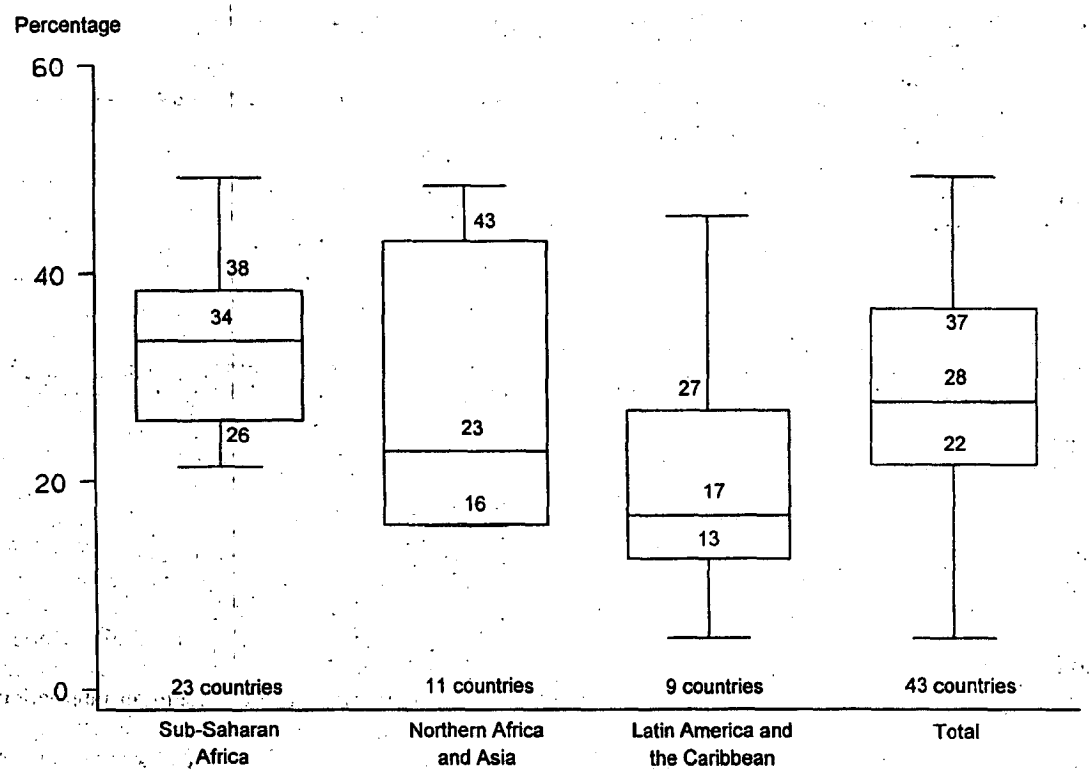
Measures of height and weight in relation to each other and to a child's chronological age provide the most useful overall assessment of nutritional status and health since, they reflect the combined effects of past and recent diet, morbidity and childcare. There are three common indicators of nutritional status: height-for-age, weight-for-age and height-for-weight (World Health Organization, 1986). Low height-for-age or stunting reflects relatively long-term or chronic undernutrition. Low weight-for-height or wasting reflects the effects of recent morbidity or deficient food intake. Low weight-for-age is a composite indicator, which may reflect stunting, wasting or both. Using an international reference population as a standard, the percentage of children who are suffering from each of these three conditions reflecting dimensions of undernutrition (stunting, wasting and underweight) can be determined. Children whose height-for-age

Z-score falls below -2 standard deviations (SD) from the median of the reference population are considered stunted. Those whose weight-for-height Z-score falls below -2 SD are considered wasted and those whose weight-for-age Z-score falls below -2 SD of the median of the reference population are deemed underweight. A Z-score is the number of standard deviation units by which a child's measurement deviates from the median of the reference population for his or her age. In the case of the weight-for-height index, the weight is related to the median weight of the standard population for a given height (World Health Organization, 1986).

Information on the percentage of children 0-35 months old who were classified as stunted, wasted or underweight is available from 43 Demographic and Health Surveys (see annex table A.10). The distribution of countries by region and according to each of the three indicators considered is presented in figures 7 (stunting), 8 (wasting) and 9 (underweight), displaying the median of each distribution, the interquartile range and the extremes of the distribution. The distributions show that there are considerable differences between regions. In general, the 23 countries of sub-Saharan Africa exhibit higher levels of children stunted, wasted or underweight than the 9 countries of Latin America and the Caribbean, whereas the 11 countries of Northern Africa and Asia show a high degree of variation in their levels of children stunted, wasted or underweight, with the central part of the distributions for that region overlapping those of both sub-Saharan Africa and Latin America and the Caribbean in figures 7 to 9.

The median values reflect the regional differences by being higher for sub-Saharan Africa, intermediate for Northern Africa and Asia, and lower for Latin America and the Caribbean. In terms of stunting, for instance, the median values are 34 per cent, 23 per cent and 17 per cent, respectively, for the three regions. Given that stunting reflects the presence of relatively long-term or chronic malnutrition, it is worrisome that out of the 23 sub-Saharan African countries considered, half exhibit levels of stunting of at least 34 per cent. Furthermore, in three quarters of those countries, at least one in every four children aged 0-35 months is suffering from stunting. A similar finding holds for children underweight: in three quarters of the sub-Saharan African countries considered, at least a quarter of all children aged 0-35 months are underweight. Wasting tends to affect lower proportions of children than stunting or underweight, but the condition is also more prevalent in sub-Saharan Africa than in other regions. Thus, in three quarters of the sub-Saharan countries considered, at least 6 per cent of all children aged 0-35 months can be classified as wasted; and in Mali, the only country that appears as an outlier in terms of wasting both in sub-Saharan Africa and in the world as a whole, 1 in every 5 children aged 0-35 months is experiencing wasting. These findings corroborate the fact that malnutrition in childhood is pervasive in sub-Saharan Africa and suggest that, even if malnutrition does not necessarily result in death, the burden it implies in terms of retarded development and vulnerability to disease is large.

Figure 7. Distribution of countries according to percentage of children aged 0-35 months who are stunted



Source: Annex table A.10.

Among the 11 Northern African and Asian countries considered, those located in the Indian sub-continent — India, Nepal, Pakistan and Sri Lanka — tend to occupy the upper quartile of each of the distributions considered, being thus characterized by high levels of malnutrition among young children. In India, for instance, over half of all children under three years of age are underweight and 47 per cent are stunted. At the other end of the distribution, Jordan, Kazakhstan, Morocco, Tunisia and Turkey tend to exhibit moderate to low levels of malnutrition among young children, although in all of them at least 16 per cent of children aged 0-35 months show evidence of stunting.

There is less variation among the nine countries located in Latin America and the Caribbean, and some countries in the region have attained relatively low levels of malnutrition among children. However, in three quarters of the countries considered, at least 1 in every 8 children aged 0-35 months is stunted and 1 in 15 is underweight. Furthermore, a few countries in the region still experience high levels of malnutrition. Thus, in Guatemala, 27 per cent of the children under three years of age are underweight and 45 per cent are stunted. In Haiti as well, over a quarter of young children are underweight and 27 per cent are stunted; and in Bolivia, the proportion stunted also ascends to 27 per cent but the proportion underweight is lower, standing at 15 per cent.

Given that malnutrition and disease operate synergistically in their effect on mortality among children (Pelletier, 1994), countries experiencing high levels of malnutrition are expected to have high levels of mortality in childhood. To examine this issue further, consider table 17 where are listed the countries above (and including) the upper quartile and below (and including) the lower quartile of the distribution of levels of stunting, wasting and underweight. It is apparent that once a country has a high level in respect of one of these indicators of malnutrition, it is likely to have high levels for the others. Thus, four countries — Eritrea, India, Nepal and Pakistan — have high proportions of children in all three categories, and six others — Burkina Faso, Burundi, Madagascar, Mali, Nigeria and Sri Lanka — have high proportions in two of the three. Generally, sub-Saharan African countries account for most countries with high proportions but, in addition, two of the world's most populous countries, India and Pakistan, appear as experiencing high levels of general malnutrition among children. As expected, among countries with high proportions of children classified as stunted, wasted or underweight, the majority also exhibit high levels of infant and under-five mortality. Thus, Benin, Burkina Faso, Burundi, Malawi, Mali, Nepal, the Niger, Pakistan and Rwanda have estimates of infant mortality in excess of 100 deaths per 1,000 live births (see annex tables A.3 and A.4), and for Eritrea, Ghana, India, Madagascar, Nigeria and the United Republic of Tanzania, infant mortality is estimated to be between 80 and 100 deaths per 1,000. Guatemala also has moderate to high levels of infant mortality. Only Sri Lanka appears as an anomaly, since its infant mortality was estimated to be a low 26 per 1,000 in 1985 although over one third of its children are underweight. Yet, the levels of stunting in Sri Lanka are not among the highest recorded.

Among the countries with the lowest proportions of children stunted, wasted or underweight, there is also substantial agreement between the different measures in the sense that once one is low the others are likely to be low also. However, the levels of malnutrition in those countries still appear to be sufficiently high as to prevent very low levels of mortality from being reached. Thus, a number of countries identified as having low levels of malnutrition with respect to the set of 43 countries considered still exhibit infant mortality above 50 deaths per 1,000 live births, including Brazil, the Dominican Republic, Morocco, Paraguay and Turkey. In general, however, the countries exhibiting lower levels of malnutrition tend to be those experiencing low to moderate mortality in childhood.

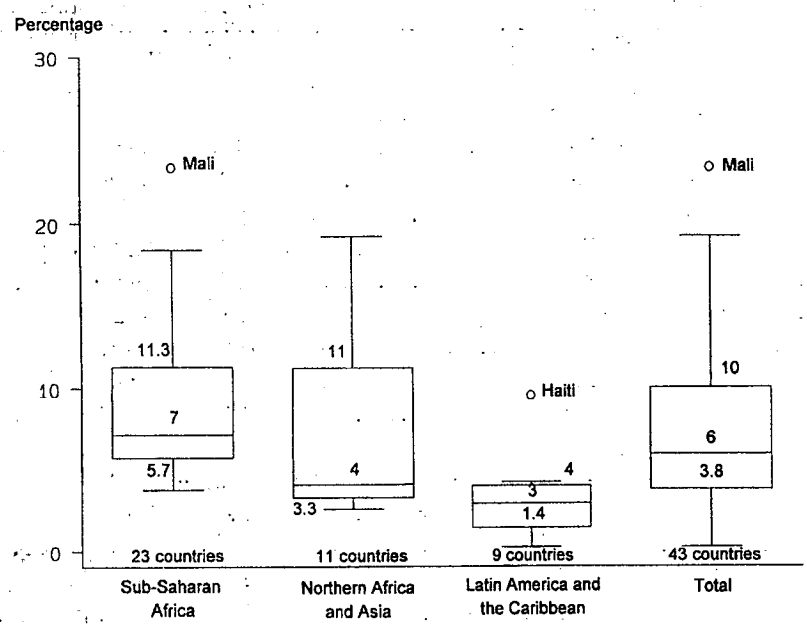
In sum, it appears that high levels of malnutrition among young children are closely related to high levels of mortality in childhood and that most developing countries have not reached as yet a sufficiently low level of malnutrition to ensure that it has no detrimental effects on survivorship at the early stages of life. Indeed, among the 43 countries considered, only 1, Trinidad and Tobago, exhibited a level of stunting below 10 per cent, indicating that the chronic effects of malnutrition are widespread. In fact, the importance of the link between malnutrition and mortality is corroborated by the size of the correlation coefficients between mortality and the proportion of children underweight (0.62), between mortality and the proportion of children experiencing wasting (0.61) and between mortality and the proportion of children stunted (0.56). Although the interrelations between nutritional status, morbidity and mortality are complex, the light shed on the picture by the data presented here leaveslittle room for complacency. Even if current levels of malnutrition do not increase death rates directly, they are bound to have a significant negative impact on the general health status of a population and are likely to contribute to stunting the physical and mental potential of a major proportion of today's children.

2. *Immunization coverage*

The World Health Organization (WHO) has set guidelines for vaccinating children. To be considered fully vaccinated, a child should receive the following vaccinations: (a) BCG,[1] given at birth for protection against tuberculosis; (b) measles; (c) three doses of DPT, for protection against diphtheria, pertussis and tetanus; and (d) three doses of the poliomyelitis vaccine. In many countries, the DPT and polio vaccines are given at one, two and three months of age and measles at nine months. Thus, according to that schedule, children should have completed all vaccinations before their first birthday. Annex table A.11 shows the proportion of children aged 12-23 months who have received specific vaccines as estimated from data gathered by 47 surveys carried out in different countries during 1986-1996 under the Demographic and Health Surveys (DHS) programme. For a full discussion of the DHS results regarding these vaccines and others (for example, yellow fever and hepatitis) and of factors that affect coverage, see Sommerfelt and Piani (1997).

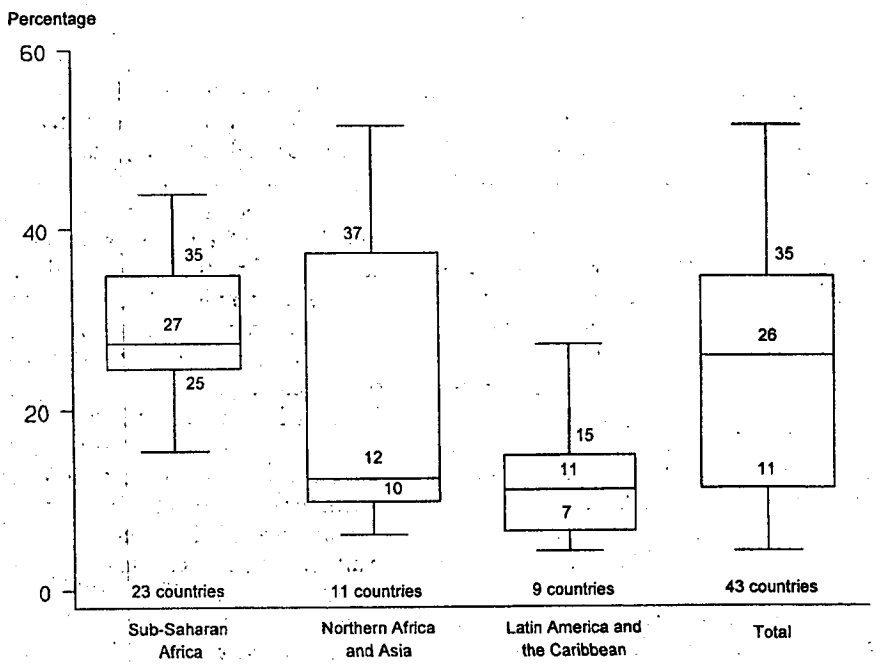
Figure 10 shows the distribution by region of countries according to the proportion of children that have been fully immunized. The regional distributions show considerable variation and indicate that only in about a quarter of the 47 countries considered has the proportion of children who have

Figure 8. Distribution of countries according to percentage of children aged 0-35 months who are wasted



Source: Annex table A.10.

Figure 9. Distribution of countries according to percentage of children aged 0-35 months who are underweight



Source: Annex table A.10.

TABLE 17. PERCENTAGE OF CHILDREN AGED 0-35 MONTHS WHO ARE STUNTED, WASTED OR UNDERWEIGHT IN DEVELOPING COUNTRIES LOCATED IN AND ABOVE THE UPPER QUARTILE AND IN AND BELOW THE LOWER QUARTILE OF EACH DISTRIBUTION, ORDERED BY LEVEL

Country or area	*Percentage stunted*	Country or area	*Percentage wasted*	*Country or area*	*Percentage underweight*
		Countries with high levels (in and above the upper quartile)			
Madagascar	49.2	Mali	23.3	India	51.5
Nepal	48.4	India	19.2	Nepal	46.9
Burundi	47.4	Niger	18.4	Niger	43.9
India	47.1	Burkina Faso	17.2	Eritrea	43.7
Guatemala	45.4	Eritrea	16.4	Mali	40.0
Pakistan	43.0	Benin	14.3	Madagascar	38.9
Rwanda	42.3	Sri Lanka	11.6	Burundi	37.5
Malawi	41.5	Ghana	11.3	Sri Lanka	37.3
United Republic of Tanzania	39.1	Nepal	11.2	Pakistan	36.9
Eritrea	38.4	Nigeria	10.5	Burkina Faso	34.8
Zambia	36.6	Pakistan	10.0	Nigeria	34.6
		Countries with low levels (in and below the lower quartile)			
Thailand	21.5	Trinidad and Tobago	3.8	Peru	11.2
Zimbabwe	21.4	Jordan	3.4	Dominican Republic	11.0
Tunisia	17.9	Turkey	3.4	Tunisia	10.3
Dominican Republic	16.6	Kazakhstan	3.3	Morocco	10.2
Kazakhstan	15.8	Tunisia	3.0	Turkey	9.8
Jordan	15.8	Brazil	2.9	Colombia	8.4
Turkey	15.7	Morocco	2.6	Kazakhstan	8.3
Paraguay	14.9	Peru	2.0	Trinidad and Tobago	6.5
Colombia	12.5	Colombia	1.4	Jordan	6.1
Brazil	10.3	Dominican Republic	1.3	Brazil	5.5
Trinidad and Tobago	4.8	Paraguay	0.2	Paraguay	4.3

Source: Annex table A.10.

been fully immunized reached levels of at least 70 per cent. The highest immunization coverage was attained in Jordan, where it reached 88 per cent of all children aged 12-23 months, but another four countries, all located in sub-Saharan Africa, also attained levels of at least 80 per cent coverage (Botswana, Malawi, Rwanda and Zimbabwe). Interestingly, with regard to full immunization coverage, the distributions by region do not show the differences that would be expected. In particular, the countries of sub-Saharan Africa tend to exhibit higher levels of full immunization coverage than those located in Latin America and the Caribbean despite the fact that the latter are generally characterized by lower mortality in childhood than the former. Thus, whereas the upper half of the distribution for the 24 countries of sub-Saharan Africa lies within the range of 49 to 86 per cent of children aged 12-23 months being fully immunized, for the 10 Latin American and Caribbean countries considered the corresponding upper half is mostly concentrated over the range of 37 to 58 per cent full immunization, with Brazil's appearing as an exceptional value at 73 per cent. For their part, the 13 countries of Northern Africa and Asia exhibit considerable variation in their coverage levels, especially over the central range of the distribution, but the distribution's upper half is concentrated over a fairly narrow range of relatively high levels of full immunization coverage: 64 to 88 per cent of children aged 12-23 months.

Examination of the coverage of a specific vaccine yields some light on the immediate causes of the differences detected regarding full immunization. Figures 11 and 12 display the distribution of countries according to the percentage of children receiving, respectively, the first dose and the full three doses of DPT. These distributions are similar to those corresponding to coverage by the polio vaccine. As figure 11 indicates, in all regions at least three quarters of all countries attain relatively high coverage levels for the first dose of the DPT vaccine (over 75 per cent). In fact, except for the case of the Niger, where less than 40 per cent of children aged 12-23 months receive a first dose of DPT, in all the countries considered the initial coverage is above 60 per cent. Yet, as figure 12 indicates, the variation in the level of coverage increases and distinct differences between regions emerge when consideration is given to full DPT coverage (that is to say, children receiving three doses of the vaccine). Only among the 11 countries of Northern Africa

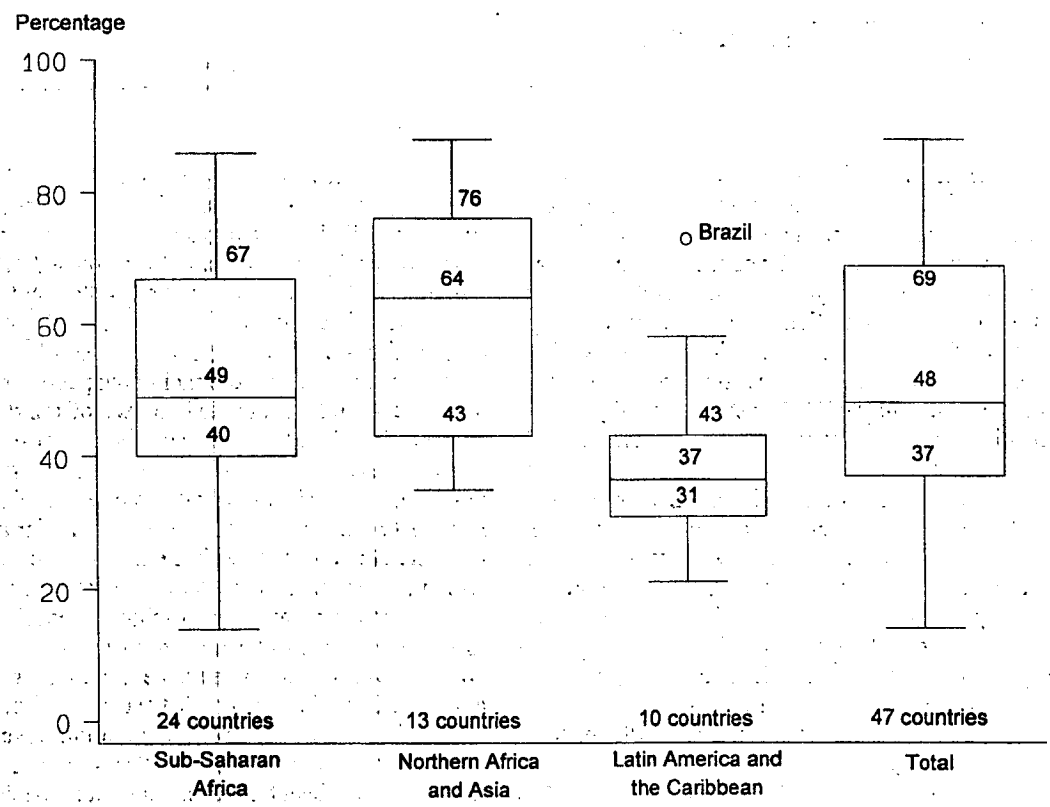
and Asia do half of the countries considered exhibit levels of full DPT coverage above 75 per cent. For countries in sub-Saharan Africa and those in Latin America and the Caribbean, the median level of coverage drops to 59 per cent, and in a quarter of countries in those regions, full DPT coverage drops below 50 per cent.

High "drop-out rates" are responsible for the differences in coverage between the first dose and the full three doses of DPT. In Burkina Faso, for instance, the 1993 survey showed that whereas 79 per cent of all children aged 12-23 months had received one dose of DPT, only 41 per cent had received the three doses required for adequate immunization. High-drop out rates were also recorded in the Central African Republic, Côte d'Ivoire, Ghana, Mali, Nigeria and Uganda in sub-Saharan Africa; Nepal in Asia; and Bolivia, the Dominican Republic, Guatemala, Haiti and Paraguay in Latin America and the Caribbean. Especially low levels of full DPT coverage were recorded in Liberia, Mexico, the Niger and Nigeria, where at most a third of children aged 12-23 were adequately immunized (see table 18). At the other end of the distribution, a coverage of over 90 per cent was reached in Brazil, Jordan, Rwanda and Sri Lanka.

Table 18 presents the countries above the upper quartile and below the lower quartile of the distribution of coverage relative to BCG, the three doses of DPT, measles and full immunization (the quartiles themselves are also included). The coverage for polio is not shown because it is similar to the coverage for DPT (Sommerfelt and Piani, 1997; and annex table A.11). In comparison with full coverage with DPT, the coverage with BCG is relatively high, with three quarters of all the countries considered having over 75 per cent of all children aged 12-23 months immunized with BCG. In fact, with the exception of Jordan and the Niger, where coverage is a low 17 per cent and 40 per cent, respectively, all other countries exhibit coverage levels of approximately 60 per cent or more. The low level registered in Jordan stems from the fact that the vaccination programme in that country does not emphasize the provision of BCG injections.

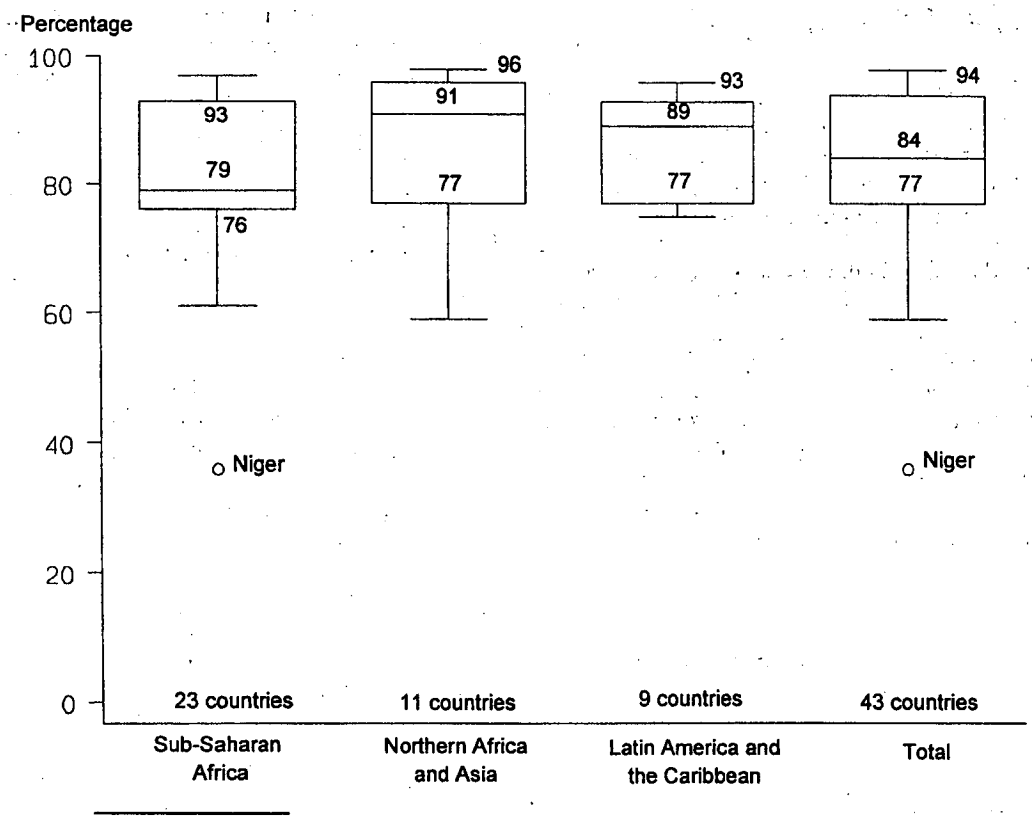
Coverage with the measles vaccine does not reach levels as high as those for BCG but is nevertheless moderate to high in most countries. Thus, in three quarters of the countries considered, at least half of all children aged 12-23 months have been vaccinated against measles. In fact, as table 18 shows, with the exception of the Niger where cov-

Figure 10. Distribution of countries according to percentage of children aged 12-23 months who are fully immunized



Source: Annex table A.11.

Figure 11. Distribution of countries according to percentage of children aged 12-23 months who received the first dose of DPT



Source: Annex table A.11.

erage with the measles vaccine is a low 28 per cent, at least 45 per cent of children aged 12-23 months are immunized against the disease in all other countries considered. It is estimated that measles accounts for about 7 per cent of all deaths of children under five years of age (United Nations Children's Fund, 1997a) and there is some evidence suggesting that children who have been immunized against measles are less likely to contract diarrhoea (Boerma, Sommerfelt and Rutstein, 1991). Consequently, high levels of immunization coverage against measles are expected to contribute to the reduction of mortality under age 5. However, when the data on levels of immunization against measles are correlated with estimates of mortality under age 5, the correlation coefficient obtained is a low -0.35, indicating that the relation between immunization coverage and recent mortality levels is weak. The results are similar when the correlation between the level of full immunization and mortality under age 5 is calculated. Once more, at -0.36, such a correlation indicates that the link between the full set of vaccines considered in this section and mortality in childhood is not very strong.

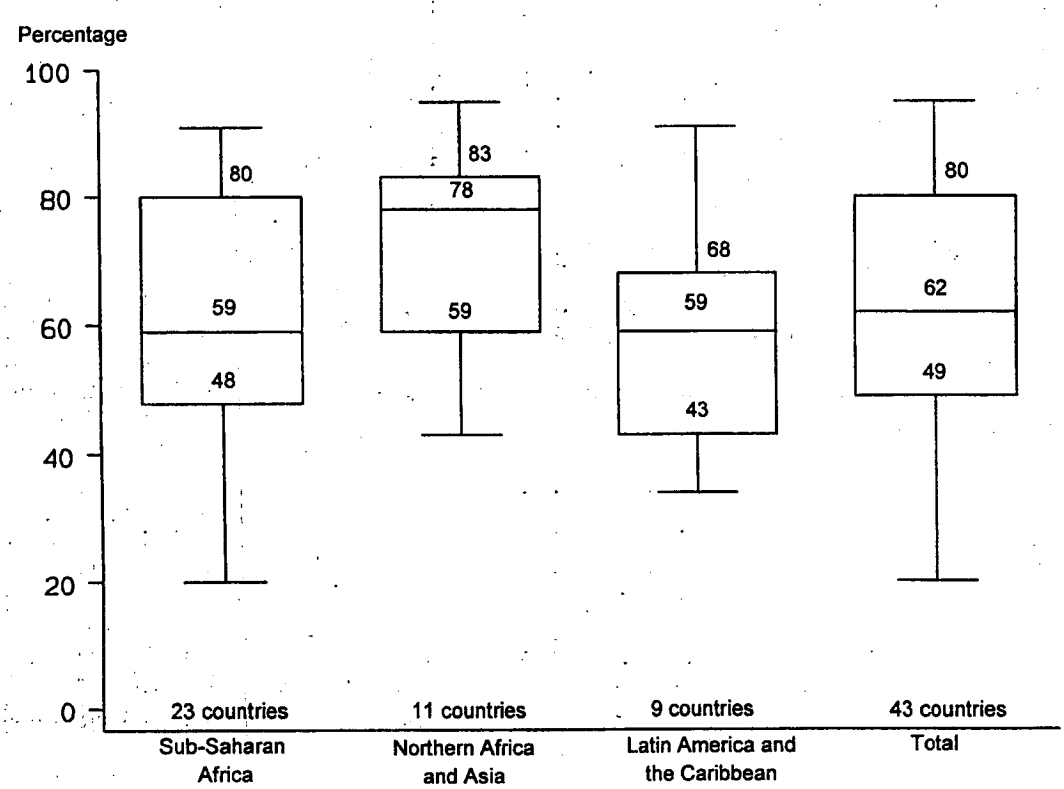
One reason for the absence of a strong correlation between immunization and mortality levels is that the latter may not reflect as yet the effects of immunization levels reached in recent years. In some countries exhibiting high immunization levels among children aged 12-23 months (see table 18), efforts to reach such levels were relatively recent and are not likely to have been realized among the children whose mortality experience is being measured. In addition, it may be that the impact of the diseases that the immunizations currently available are meant to prevent may already be less significant among causes of death under age 5 in many countries. Thus, the main causes of death under age 5, as presented by the United Nations Children's Fund (UNICEF) (1997a), do not include explicitly the contributions of diseases such as polio, diphtheria, pertussis, tetanus or tuberculosis, although some of their impact may be reflected by the 16 per cent of deaths under age 5 that are attributed to "other causes". Be that as it may, the lack of a strong statistical relation between current levels of immunization coverage and recent mortality levels in childhood in no way implies that achieving a more comprehensive coverage will not enhance the health status of both children and the adults that they will become. Polio, for instance, may no longer be a cause of death for large numbers of children, but any incidence of the disease above zero is likely to imply a significant disability burden for society as a whole and for the individuals affected. Clearly, to ensure a healthy life for today's children, efforts to increase immunization coverage need to be continued and strengthened.

3. *Child morbidity prevalence and treatment of diarrhoea*

Diarrhoea is one of the major causes of morbidity and mortality among children under age 5. It is estimated that about one in every five deaths among children in that age group is caused directly or indirectly by diarrhoea (United Nations Children's Fund, 1997a). Yet, diarrhoea is a condition that is amenable to treatment by relatively simple methods. Because most of the deaths ascribed to diarrhoea are due to dehydration, WHO recommends the use of oral rehydration therapy (ORT), be it by means of special solutions produced commercially, by preparing solutions from pre-packaged oral rehydration salts (ORS packets) or by using home-made solutions that include sugar, salt and water (in specific proportions). Increasing the amount of any other type of fluids during a diarrhoeal episode can also be considered a form of ORT. However, for some forms of diarrhoeal morbidity, the use of anti-diarrhoeal and antibiotic drugs is required and medical assistance needs to be sought. The Demographic and Health Surveys measure the prevalence of diarrhoea by recording episodes among children under age 5 during the two weeks preceding the survey. Methods of treatment are also recorded. Data on these issues are available for 31 countries. Because the prevalence of diarrhoea varies substantially by season and the surveys were carried out in different seasons in the various countries, the estimates presented here cannot be interpreted as reflecting cross-country differences in prevalence. A further source of lack of comparability derives from the fact that in some surveys the occurrence of diarrhoeal episodes were recorded only for children under age 3 (in India, the cut-off point was age 4).

Diarrhoea appears to be a fairly common occurrence among children in many countries. At least one in every five children under age 5 had a diarrhoeal episode within the two weeks preceding the survey in 14 of the 31 countries covered (table 19). Eleven of those 14 countries are in sub-Saharan Africa, one is in Asia (Turkey) and two are in Latin America and the Caribbean (Bolivia and Haiti). The median prevalence in sub-Saharan Africa is 20 per cent, being somewhat lower in Latin America and the Caribbean (17.5 per cent) and lower still in Northern Africa and Asia (12.5 per cent). However, because of the confounding effects of the seasonal nature of diarrhoea when no control is included for the timing of the survey, it is more appropriate to focus on treatment patterns when comparing countries.

Figure 12. Distribution of countries according to percentage of children aged 12-23 months who received all three doses of DPT



Source: Annex table A.11.

TABLE 18. PERCENTAGE OF CHILDREN AGED 12-23 MONTHS IMMUNIZED FOR SPECIFIC VACCINES IN DEVELOPING COUNTRIES IN AND ABOVE THE UPPER QUARTILE AND IN AND BELOW THE LOWER QUARTILE OF EACH DISTRIBUTION, ORDERED BY LEVEL OF COVERAGE

Country or area	*Percentage immunized with BCG*	*Country or area*	*Percentage immunized against measles*	*Country or area*	*Percentage fully immunized with DPT*	*Country or area*	*Percentage with full immunization*
Countries with low coverage (in and above the upper quartile)							
Jordan	17	Niger	28	Niger	20	Liberia	14
Niger	40	Thailand	45	Liberia	20	Niger	17
Yemen	59	Nigeria	46	Nigeria	33	Mexico	21
Liberia	60	Liberia	47	Mexico	34	Nigeria	29
Nigeria	61	Haiti	48	Mali	38	Haiti	30
Eritrea	61	Pakistan	50	Haiti	41	Bolivia	31
Paraguay	67	Yemen	50	Burkina Faso	41	Mali	32
Pakistan	70	Mali	51	Pakistan	43	Paraguay	34
Dominican Republic	70	Eritrea	51	Bolivia	43	Burkina Faso	35
Haiti	73	Central African Republic	52	Yemen	45	Pakistan	35
Mexico	73	Côte d'Ivoire	53	Cameroon	47	Central African Republic	37
Côte d'Ivoire	74	Madagascar	54	Central African Republic	48	Thailand	37
						Dominican Republic	37
Countries with high coverage (in and below the lower quartile)							
Morocco	93	Morocco	80	Philippines	80	United Republic of Tanzania	71
Brazil	93	Philippines	81	United Republic of Tanzania	80	Philippines	72
Zambia	95	United Republic of Tanzania	81	Egypt	83	Brazil	73
United Republic of Tanzania	95	Kenya	84	Zimbabwe	85	Morocco	76
Tunisia	95	Tunisia	84	Kenya	87	Kenya	78
Egypt	95	Zimbabwe	86	Tunisia	88	Tunisia	78
Botswana	95	Malawi	86	Botswana	88	Egypt	79
Kenya	96	Botswana	87	Malawi	89	Zimbabwe	80
Zimbabwe	96	Brazil	87	Brazil	91	Botswana	81
Malawi	97	Egypt	89	Rwanda	91	Malawi	82
Rwanda	97	Jordan	89	Sri Lanka	91	Rwanda	86
Sri Lanka	98	Rwanda	90	Jordan	95	Jordan	88

Source: Annex table A.11.

NOTE: Full immunization with DPT means that three doses were given. Those fully immunized received BCG, measles and three doses each of DPT and polio vaccines.

In 20 of the 31 countries considered, more than half of the children suffering from diarrhoea during the two weeks preceding the survey received some form of ORT. Because the DHS surveys include as ORT the use of not only commercial oral rehydration solutions and of ORS packets provided by health workers but also home-made solutions that include sugar and salt, and other home solutions that are used to increase fluid intake, there may have been some confusion among respondents who were not familiar with ORT in the sense that certain components of traditional weaning diets may have been considered a version of ORT. It is important, therefore, to focus on those children who received a standard version of ORT, mainly through the use of ORS packets. As table 19 shows, only in 5 of the 31 countries considered were more than half of the children suffering from diarrhoea treated with solutions made from ORS packets — Bangladesh, Namibia, the United Republic of Tanzania, Zambia and Zimbabwe. Among the 16 sub-Saharan African countries considered, the median value for the proportion of children treated with ORS packets is 28 per cent; it is higher for the nine countries in Northern Africa and Asia (34 per cent), but lower for the six countries covered in Latin America and the Caribbean (25 per cent). Considering the simplicity of oral rehydration as a treatment for diarrhoea, it is surprising that it is not used more commonly among children in developing countries. Although most diarrhoeal episodes are probably mild and respond to traditional home remedies, diarrhoeal diseases continue to be one of the leading killers of children in the developing world. In countries such as Burkina Faso, Madagascar and the Niger, which have among the highest childhood mortality levels in the world, treatment of diarrhoea, when it occurs, is far from adequate. A study based on DHS data for 21 countries concludes that women living in urban areas and those having more years of education are more likely to use standard ORT based on ORS packets to treat diarrhoea in their children (Boerma, Sommerfelt and Rutstein, 1991). It also finds that the prevalence of diarrhoea is lower in regions where there is piped drinking water and access to toilet facilities. Such factors would likely contribute to reducing the prevalence not only of diarrhoeal disease but also of other infectious diseases associated with poor hygiene; but even when improvements of the water supply and sewerage facilities are not possible, focused educational campaigns are an effective means of increasing the use of ORT.

Table 19 also displays the proportions of children with diarrhoea who are taken to a medical facility. For about two thirds of the countries considered, there is considerable agreement between these proportions and those of children receiving treatment based on ORS packets, a finding that suggests that the packets were mostly obtained from medical facilities. However, in the cases of Côte d'Ivoire, Egypt, India, Madagascar, Nigeria, Paraguay, Senégal and Turkey, the proportion of children treated in a medical facility is at least 10 percentage points higher than that of children receiving treatment based on ORS packets. In India, for instance, 61 per cent of children with diarrhoea were taken to a medical facility but only 17.5 per cent were treated with ORS packets. There are also a few countries where the proportion of children treated with ORS packets is considerably higher than that of children treated in medical facilities. In Bangladesh, for instance, about half of all children experiencing a diarrhoeal episode were treated with ORS packets but a lower 20 per cent were taken to medical facilities. Similarly, in Zimbabwe, 80 per cent of the children with diarrhoea were treated with ORS packets but only 30 per cent were taken to medical facilities. These last examples suggest that it is possible to attain fairly high coverage through standard ORT even in contexts where the use of medical facilities is far from universal.

Prevalence and treatment of acute respiratory infection and fever

Acute respiratory infection (ARI) is another major cause of morbidity and death among young children. Common symptoms associated with severe ARI include fever, cough and difficult or rapid breathing. However, fever may be due to other infections, such as malaria. Typically, ARI involves the upper respiratory tract and may progress to involve the lower respiratory tract, leading to lung infection and pneumonia, both of which are associated with high mortality risks. However, early diagnosis and treatment with antibiotics can prevent a large proportion of deaths by pneumonia. In DHS surveys, women are asked whether their children (those below age 5) have been ill with a cough accompanied by fast breathing and whether the children have had a fever during the four weeks preceding interview. The data thus obtained rely on the mother's recall of events and could therefore be biased, so that the results obtained should not be interpreted too rigidly. As in the case of diarrhoea, the prevalence of cough with rapid breathing and of fever is likely to vary seasonally. Therefore, differences in prevalence between countries cannot be interpreted as representing actual differences unless allowance is made for seasonal variations. To avoid such problems, the focus here is on the type of treatment sought rather than on estimates of prevalence.

Table 20 displays the data on prevalence of cough and rapid breathing as well as of fever for 29 developing countries. The prevalence of the former is generally low. In only eight countries, at least one in every five children under age 5 is reported as experiencing a cough and rapid breathing during the four weeks preceding the survey. For the remaining 21 countries, the prevalence of those symptoms is relatively low, with six countries — Cameroon, Egypt, India, Nigeria, the Philippines and the United Republic of Tanzania — reporting a prevalence of less than 10 per cent. In contrast, fever is a more common occurrence in almost all countries, being reported among at least 40 per cent of all children under 5 in Côte d'Ivoire, Haiti, Kenya, Malawi, the Niger, Rwanda, Zambia and Zimbabwe. In only two countries—the Dominican Republic and Morocco — was the prevalence of fever below 20 per cent.

Table 20 also shows the proportion of children taken to a medical facility for treatment of either cough or fever. The medical facilities considered include hospitals, clinics and private doctors. Pharmacies were not included in that group. Whether the focus is on treatment of cough and rapid breathing or on fever, there is considerable variation in the proportions of children taken to a medical facility; that is to say, there is greater variation in the use of medical facilities than in the prevalence of either set of symptoms, indicating that the impact of illness on mortality is strongly mediated by access to effective treatment. Relatively high levels of

TABLE 19. PERCENTAGE OF CHILDREN UNDER AGE 5 HAVING DIARRHOEA DURING THE TWO WEEKS PRECEDING A SURVEY AND PERCENTAGE RECEIVING SPECIFIC TREATMENT

Country or area	Survey period	Percentage of children under age 5 with diarrhoea	Percentage of children with diarrhoea who: Received no oral rehydration therapy	Were treated with ORS packets	Were treated with a home-made solution	Were treated at a medical facility
Sub-Saharan Africa						
Burkina Faso	1992-1993	20.1	56.9	12.0	7.7	14.8
Cameroon	1991	17.6	34.1	18.0	25.3	20.1
Central African Republic [b]	1994-1995	22.6	21.1	27.7	7.2	30.0
Côte d'Ivoire [b]	1994	21.6	48.1	11.1	8.7	23.2
Ghana [b]	1993	20.0	54.4	28.6	13.8	24.0
Kenya	1993	13.8	42.6	31.6	..	40.8
Madagascar	1994	12.3	38.8	14.2	15.1	35
Malawi	1992	21.7	26.7	43.2	38.8	47.2
Namibia	1992	20.5	33.2	63.2	2.1	68.0
Niger	1992	27.7	76.5	10.4	9.5	9.8
Nigeria	1990	17.7	66.5	11.7	23.6	26.8
Rwanda	1992	21.6	51.3	27.6	19.4	22.8
Senegal	1992-1993	20.4	53.1	6.6	11.4	23.1
United Republic of Tanzania	1991-1992	12.9	29.6	57.2	18.9	59.4
Zambia	1992	22.5	25.7	52.9	22.8	54.6
Zimbabwe [b]	1994	23.5	13.7	79.2	12.8	29.7
Northern Africa						
Egypt	1992	13.3	57.5	28.9	5.8	45.2
Morocco	1992	12.6	46.3	13.9	2.5	10.1
Asia						
Bangladesh [b]	1993-1994	12.3	28.4	50.3	15.5	20.2
India [a]	1992-1993	9.9	64.1	17.5	18.6	61.1
Indonesia	1994	12.1	26.0	45.1	..	53.2
Jordan	1990	8.5	58.6	41.4	...	49.7
Pakistan	1990-1991	14.5	54.7	38.5	12.0	47.7
Philippines	1993	10.1	41.4	27.1	36.2	33.8
Turkey	1993	24.7	40.0	11.3	4.8	24.6
Latin America and the Caribbean						
Bolivia [b]	1993-1994	29.6	35.2	33.3	9.7	32.4
Colombia	1995	16.7	32.1	44.5	8.4	33.3
Dominican Republic	1991	16.5	69.3	25.2	12.1	30.0
Haiti	1994-1995	27.4	42.8	25.7	9.4	24.1
Paraguay	1990	8.1	41.6	24.0	10.6	36.6
Peru	1991-1992	18.3	49.6	19.8	11.5	21.9

Source: Special tabulations of Demographic and Health Surveys provided by Macro International, Inc.
[a]Sample of children limited to those under age 4.
[b]Sample of children limited to those under age 3.

children received treatment at medical facilities in 11 of the 29 countries considered — over half of the children with cough and rapid breathing were taken to such facilities. In fact, the proportion thus treated was over 60 per cent in India, Indonesia, Namibia, Pakistan, the United Republic of Tanzania and Zambia. At the other extreme of the distribution, in Bangladesh, Burkina Faso, Haiti, Morocco, the Niger, Rwanda and Senegal, less than a third of children were taken to a medical facility when they had cough and rapid breathing.

There is a great degree of similarity between the proportions of children treated in a medical facility for cough and rapid breathing and those of children treated in a facility for fever. In fact, differences of 5 or more percentage points between the two proportions are noticeable in only 10 countries: Cameroon, the Central African Republic, Kenya, Nigeria, the United Republic of Tanzania and Zimbabwe in sub-Saharan Africa; Indonesia and the Philippines in Asia; and Bolivia and Colombia in Latin America. In all cases where the discrepancies are large, the proportion of children with

cough and rapid breathing treated at a medical facility is higher than that of children with fever, probably because the former show symptoms that are more difficult to ignore. In fact, in populations that have no ready access to thermometers, the reporting of fever has been shown to be prone to error, especially in cases where parents are not able to ascertain that a child has an above-normal temperature because the latter is not too high (Einterz and Bates, 1997).

The interpretation of the data on treatment patterns for cough and rapid breathing and for fever is complicated by the fact that the severity and duration of the symptoms are not recorded. In countries with high prevalence of disease, it is likely that only the children with the most severe symptoms will be taken to a medical facility, whereas those with less severe symptoms may not be treated at all or may be treated with home remedies or those bought in pharmacies. In countries with lower disease prevalence and with more accessible medical facilities, parents may seek professional attention for their children even if the symptoms experienced are mild. Be that as it may, the data presented above show that countries where a lower proportion of sick children are taken to a medical facility are often characterized by relatively high mortality in childhood, as in the cases of Bangladesh, Burkina Faso, Haiti, the Niger and Rwanda. However, high mortality is also prevalent among some countries where high proportions of sick children are treated at medical facilities, as is the cases of India, Malawi and Pakistan. In sum, this overview of health indicators among young children suggests that the interrelations between mortality levels and nutritional status, immunization coverage, prevalence of disease and methods of treatment are far from straightforward. Although certain broad regional patterns emerge, the variation within regions is such that few generalizations are possible. Perhaps the strongest links between mortality in childhood and indicators of health status are those that involve indicators of nutritional status. In countries with high proportions of children suffering from stunting, wasting or underweight, mortality levels in childhood tend to be high. Furthermore, because the vast majority of developing countries has yet to erradicate malnutrition among children, its detrimental effects on health status, human development and future mortality cannot be ignored. With respect to the prevention of disease, although great progress has been made in extending immunization coverage among the children of developing countries and especially among those of the least developed countries, it would appear that the levels of immunization reached recently have not yet had a measurable impact on mortality reduction. Furthermore, in many countries the proportion of children who lack full immunization coverage is still high and, even when those countries experience intermediate rather than high levels of mortality in childhood, reaching universal coverage is necessary to reduce disability and ensure a healthier lifespan for the children that survive beyond age 5. With regard to the prevalence of the major infectious diseases responsible for mortality at young ages, the crucial variation seems to pertain not so much to the prevalence of illness but rather to whether treatment is sought and the type of treatment obtained. Providing parents with the tools to judge whether their children are in imminent danger and with access to the means of treating common childhood illnesses continues to be an objective commanding priority. Clearly, investing in the health of children and working towards ensuring that all children have equal chances of being protected against preventable illness and of being treated if they fall sick constitute the best strategy to ensure a better future for the peoples of the developing world.

4. *Sex differentials in child health*

Sex differentials among children under age 5 with respect to nutritional status, morbidity and access to treatment were examined as part of a larger study undertaken by the Population Division of the United Nations Secretariat (United Nations, 1998d). The results from that study for nutritional status, morbidity and treatment patterns are summarized in the present subsection.

Differences between boys and girls in nutritional status were analysed according to the results of 41 Demographic and Health Surveys carried out in 34 countries. As mentioned above in the subsection on nutrition, the DHS surveys recorded height and weight measurements of children aged 0-35 months. The analysis showed that there were relatively small differences between boys and girls in terms of the prevalence of stunting, underweight and wasting. If anything, the data suggest that girls are less likely to be malnourished than boys. Among the countries studied, nutritional problems for both sexes were worse in sub-Saharan Africa and South-central Asia (Pakistan and Sri Lanka, in particular) than in Latin America, Western Asia and Northern Africa.

Differentials by sex in the probability of receiving any vaccination or in the probability of receiving the full series of recommended vaccines are small in most parts of the world and do not clearly favour either sex. However, the results for three countries in South-central Asia (Bangladesh, Pakistan and the States of northern India) show that boys are significantly more likely than girls to have received any vaccination and to have received a measles vaccination. Among children who were given any vaccination, the proportion fully vaccinated was also higher for boys than for girls in the northern States of India and in Pakistan, but not in Bangladesh. Boys are also slightly more likely to be vaccinated than girls in Northern Africa and Western Asia.

The study also considered the prevalence of diarrhoea, fever and cough as well as their treatment. An examination was made of whether, among those children who are sick, there are systematic differentials by sex in receiving treatment and whether, among those children who receive treatment, there are significant differentials by sex regarding the source and type of treatment received. The male-to-female ratios in the probability of being treated in any way vary only moderately around 1. In countries where most children with diarrhoea receive treatment, differentials by sex tend to be small. One exception is the northern States of India, where levels of treatment, though high, favour boys. At the intermediate levels of treatment, there are countries showing male advantage as well as countries showing female advantage. In countries where only a minority of children are treated, boys tend to be favoured. The pattern for treatment of fever is similar. Significantly more boys than girls were treated in six countries and significantly more girls in three. For cough, a significant sex differential in favour of girls is found in two countries but one in favour of

boys exists in five. There is thus a small but widespread tendency for boys with symptoms of disease to be more likely to receive treatment than girls. This pattern is noticeable in all regions except in Eastern and Southern Africa.

Information on the use of modern health facilities and providers refers to treatment in public and private health centres, and in clinics, and is taken to mean access to effective treatment. In general, few consistent patterns exist in the ratio of boys to girls as regards their being taken to modern health facilities to be treated for diarrhoea, fever or cough. The only country where there was a significant difference by sex in the use of modern health facilities for more than a single symptom was India. Indian boys whose symptoms are treated are about 5 per cent more likely to be taken to a modern health facility than sick girls who are treated. At the regional level, boys are slightly more likely to be treated at a modern health facility in most parts of the world. However, all but one of the Western African surveys found that girls with diarrhoea who are treated are more likely to be taken to a provider of modern services than boys who are treated. In contrast, in most of the Western African surveys, boys whose fever is treated are more likely to be taken to a modern facility than girls whose fever is treated.

In sum, the main regions of the world where a consistent pattern of higher mortality among girls than among boys has tended to prevail are Northern Africa, Western Asia and, particularly, Southern Asia. Although a number of factors probably contribute to this outcome, the major proximate determinants of higher mortality among girls appear to be the tendency to forgo the immunization of girls (they display lower levels of immunization than boys) and the fact that girls are less likely to receive effective treatment when they are ill. Underlying these disparities in terms of access to preventive and curative health care are societal values that attach less worth to the lives of women than to those of men. Therefore, the task of combating excess female mortality involves more than ensuring the availability of adequate health services for all children. It demands that societies learn to value women as much as men so that investments in their health, education and general welfare become examples of normal rather than exceptional behaviour. Governments, by providing leadership in effecting the necessary changes, can play a crucial role in attaining this goal.

C. Child survival interventions*

In the early 1980s, the international community mobilized around a strategic set of low-cost, high-impact actions aimed at reducing the preventable deaths of children. This ambitious endeavour came to be known as the child survival and development revolution (CSDR). CSDR helped to mobilize political will, used communication and social mobilization to raise awareness of child health problems, and expanded the use of proved technical interventions, making the most of local resources. CSDR efforts to promote growth monitoring and promotion, oral rehydration, breastfeeding, immunization, family spacing, female education and food supplementation (known as GOBI-FFF) became a cornerstone of UNICEF work in health and nutrition. Bilateral support, especially from several key donors, for child survival action was of strategic importance for programme acceleration and effectiveness.

By the mid-1980s, universal child immunization (UCI) became a major activity in many health programmes. The achievements of UCI helped to reorient health systems through creation of awareness and demand, community outreach, multisectoral social mobilization and the engagement of high-level political support. UCI and other child survival interventions also helped to draw further attention to issues of capacity-building and of sustaining programmes, at national and community levels, and to the need to address many of the health needs of children from a solid base of viable health services.

The World Summit for Children in 1990 was a significant milestone in accelerating child health and development. The Summit was preceded by a two-year process of priority-setting and consensus-building based on national and regional forums and global-level technical consultations among national, United Nations, international and bilateral technical agencies. This process, in turn, built on a decade of efforts to strengthen epidemiological capacities throughout the developing world, enabling improved assessment and monitoring of health status. Emboldened in part by the dramatic progress of global immunization efforts, world leaders agreed to a strategic set of 27 time-bound goals, charting a course for human development through the end of the decade. These goals cover critical areas in human development, from immunization to nutritional status, and from primary school enrolment to safe drinking water. Lowering infant and child mortality by a third, and maternal mortality by half, are envisaged through the cumulative impact of these multisectoral efforts.

International efforts to improve child survival and development have been strengthened in the 1990s, with national Governments, United Nations agencies, non-governmental organizations, and bilateral and multilateral organizations working in close partnership. Consequently, in 1996, a United Nations mid-decade review of the World Summit for Children follow-up reported that significant progress had been made towards achieving the goals for the year 2000 (United Nations, 1996a). It was estimated that about 80 per cent of the world's children were covered by immunization services by 1990, up from 15 per cent of children or less in many parts of the world in the mid-1970s. ORT is being used in almost every country in the developing world to prevent dehydration and death from diarrhoeal diseases. Polio and guinea worm disease are on the verge of eradication. Over 12,000 hospitals are designated "baby-friendly" as a result of their efforts to promote and protect breastfeeding. It is estimates that an additional 1.5 billion people have begun to consume iodized salt, protecting about 12 million infants each year from mental retardation. Overall, three in five countries now either are firmly on track to reach the overall goal of improved child survival by the year 2000 or have nearly achieved it.

*Prepared by the United Nations Children's Fund, New York.

TABLE 20. PERCENTAGE OF CHILDREN AGED 0-59 MONTHS WITH COUGH AND RAPID BREATHING AND PERCENTAGE WITH FEVER DURING THE TWO WEEKS PRECEDING A SURVEY AND PERCENTAGE OF CHILDREN WHO WERE TAKEN TO A MEDICAL FACILITY

Country or area	*Children with cough and rapid breathing*		*Children with fever*	
	Percentage	*Percentage treated at a medical facility*	*Percentage*	*Percentage treated at a medical facility*
Sub-Saharan Africa				
Burkina Faso	11	19	35	19
Cameroon	9	46	23	41
Central African Republic [a]	28	41	35	32
Côte d'Ivoire [a]	14	38	44	35
Ghana [a]	10	43	28	47
Kenya	18	52	41	47
Madagascar	16	42	27	39
Malawi	14	54	40	51
Namibia	18	67	34	65
Niger	11	14	45	11
Nigeria	7	37	32	32
Rwanda	32	30	41	31
Senegal	14	32	38	32
United Republic of Tanzania	8	65	31	57
Zambia	13	62	43	61
Zimbabwe [a]	25	52	40	39
Northern Africa and Asia				
Bangladesh	24	28	..	..
Egypt	8	59	21	59
India [b]	6	66	20	69
Indonesia	10	63	28	57
Morocco	15	17	17	18
Pakistan	16	66	27	65
Philippines	9	51	25	43
Turkey	12	37	30	37
Latin America and the Caribbean				
Bolivia [a]	18	40	29	28
Colombia	24	49	28	32
Dominican Republic	21	41	19	43
Haiti	20	27	40	25
Peru	23	33	31	..

Source: Special tabulations of Demographic and Health Surveys provided by Macro Systems International, Inc.
[a]Sample of children limited to those under three years of age.
[b]Sample of children limited to those under four years of age.

1. *Recent efforts and achievements*

Child immunization

Child immunization has been one of the key public-health interventions for the last 15 years. In the effort to expand immunization coverage, work has been carried out on diverse fronts: sensitizing Governments through political advocacy, mobilizing and educating communities, making immunization programmes sustainable, and introducing new vaccines. Immunization interventions are aimed at achieving the World Summit goal of maintaining at least 90 per cent coverage by vaccines to combat diphtheria, pertussis, tetanus, measles, poliomyelitis, tuberculosis, and tetanus among women of childbearing age. As a step towards attaining these goals, specific mid-decade targets were set — raising immunization coverage of the Expanded Programme on Immunization (EPI) antigens to 80 per cent or more in every country;

reducing measles deaths by 95 per cent and measles cases by 90 per cent; eradicating poliomyelitis in selected countries and regions by 1995; and eliminating neonatal tetanus by 1995 (United Nations, 1996a) (see box 4).

At current levels of immunization, almost 3 million children are saved annually; but there are still 2 million children dying because they are not immunized (United Nations, 1996). The burden of diseases preventable by immunization is greatest in sub-Saharan Africa, a result of low immunization coverage and poor health infrastructure. Globally, moreover, large numbers of children are still not reached with vaccines: those in war-torn countries, in remote areas, or in newly urbanized settlements; those ostracized because of AIDS; those living in absolute poverty; and those who live in countries with weak administrative and health systems.

The UCI programme has made great efforts in terms of not only standardizing the vaccine technology and cold chain but also ensuring that sustainable mechanisms are established for continued availability and distribution of vaccines and immunization-related supplies. The "Vaccine Independence Initiative" supported by UNICEF helps countries to start paying for their own vaccines. The European Union has also set up a mechanism to enable developing countries to procure EPI vaccines at subsidized prices. Immunization activities are increasingly being integrated into primary health care services and added on to district health systems, so that immunization services are truly institutionalized. Such integration also increases the ability to reach out to the most vulnerable and inaccessible families and children.

Despite significant increases in immunization coverage in the last decade, measles remains a major cause of childhood death and ill health in many developing countries. WHO estimates that measles alone accounts for more children's deaths than any other vaccine-preventable disease. Measles can also lead to lifelong disabilities such as brain damage, blindness and deafness. The disease is highly contagious and transmission can occur rapidly before the appearance of clinical symptoms. Despite such intractable problems, innovative strategies have been developed to contain outbreaks and to interrupt transmission among high-risk groups through mass immunization, vitamin A supplementation and fortification, and active disease surveillance.

The Latin America and Caribbean region has made the most progress in the reduction in measles deaths, whereas sub-Saharan Africa and South Asia are lagging behind all other regions. Globally, given the current average rates of coverage, about 72 per cent of the 130 million cases of measles deaths that would have occurred in the absence of immunization are being averted.

BOX 4. IMMUNIZATION: A PEOPLE'S MOVEMENT

Not only is immunization is the world's largest public-health intervention involving high-technology inputs, but has also set unprecedented records in mobilization and public participation. It has brought together some of the most diverse groups and organizations for the cause of children. A recent strategy that is growing in use is mass immunization, which is now the most common method of controlling the spread of wild poliomyelitis virus. In 1995 alone, more than 60 countries where polio is endemic conducted national immunization days. Notable among these was India, where 82 million children under age 3 were immunized in a single day. From the Ministry of Health and Family Welfare through the Village Councils, all sections of the society, especially the media, the private sector and non-governmental organizations, actively participated to make the national immunization days successful. India accounts for almost 20 per cent of world births annually and also more than half of reported cases of polio. The campaign is expected to reduce the incidence of the disease significantly.

In China, the incidence of polio dropped from 5,000 cases in 1990 to 0 cases in 1995, following successful implementation of national immunization days in the preceding two years. Similar campaigns have been conducted in other Asian countries.

National immunization days also provide an unique opportunity to immunize children against measles and provide vitamin A supplements. In addition, eligible mothers have also been immunized with tetanus toxoid, to protect infants in subsequent pregnancies against neonatal tetanus.

Source: World Health Organization, *State of the World's Vaccines and Immunizations* (Geneva, 1996).

Progress on polio eradication is encouraging. Globally, the incidence of polio declined from 35,000 in 1988 to 6,000 reported cases annually in 1995 (United Nations, 1996a). Polio has been certified as eradicated across the Americas. In addition to the 27 countries of that region, 70 other countries have reported zero polio incidence during the last three years. At current levels of coverage, the global eradication goal by the year 2000 looks achievable, although certification may only happen after that date; but, disturbingly, progress has been slowest in the countries with the greatest burden of polio, almost all of them in sub-Saharan Africa and South Asia.

Neonatal tetanus is yet another major health problem, especially where births are not attended by a trained midwife. The major risk factors for neonatal tetanus deaths are non-vaccination of women and delivery in unhygienic environments. Deaths from neonatal tetanus have stagnated at about a half million a year since 1990, despite growing numbers of births. It is estimated that about 600,000 infants are saved from neonatal tetanus each year because of immunization. Many countries — over 120 — have virtually eliminated the disease by bringing down the rate to less than 1 per 1,000 live births. Significant progress in reducing neonatal tetanus has been registered in China, India and Indonesia through the use of the "high-risk areas" method, in which endemic areas are targeted.

Oral rehydration therapy

Diarrhoeal dehydration, still the single largest cause of death among children under age 5, causes the loss of the body's vital fluids, which quickly leads to death. The administration of ORT reverses these effects in most cases, and risks are lowered even further with continued feeding and increased fluid intake. Thanks to the widespread use of ORT, most deaths from dehydration are now averted.

The World Summit for Children set a goal of reducing diarrhoeal deaths by half and the diarrhoea incidence rate by one quarter by the end of the decade. Challenges remain in attaining the mid-decade goal of ORT use in 80 per cent of diarrhoeal episodes; however, the increase in ORT use reflects an improvement in home management of diarrhoea. Programmatically, ORT has become a universal priority among health interventions, with over 120 countries possessing diarrhoeal disease control programmes; in 1980, just 8 countries had such programmes. The production of ORS has increased from 51 million sachets in 1980 to 800 million sachets in 1995, with two thirds of the world's supply now produced by developing countries (United Nations Children's Fund, 1997b).

Acute respiratory infections

Acute respiratory infections (ARIs), especially pneumonia, are another major cause of sickness and childhood mortality, accounting for almost 2 million under-five deaths and 30 to 40 per cent of paediatric visits to health facilities. Standard case management, including proper use of antibiotics, could prevent most of these deaths. The end-decade goal set at the World Summit for Children called for reduction by one third of the deaths due to ARI among children under age of 5.

At the beginning of the decade, few countries had the knowledge and tools needed to reduce mortality due to ARI; but by end-1994, 59 of the 88 high-risk countries had programmes that provided correct case management and taught caregivers, households and communities how to recognize the symptoms and when to seek care (United Nations, 1996a). Strengthening drug supply mechanisms and the capacity of health services are crucial to the success of ARI control programmes.

Integrated management of childhood illness

The integrated management of childhood illness (IMCI) is a strategy developed by WHO and UNICEF since 1992 to further contribute to the reduction of mortality in childhood due to five leading causes: diarrhoea, pneumonia, malaria, measles and malnutrition. These conditions are responsible for over 70 per cent of child deaths. IMCI is a paradigm shift from vertical approaches to an integrated approach, bringing together preventive and curative actions. It builds upon the experiences gained and lessons learned from the implementation of vertical programmes, especially the control of diarrhoeal disease (CDD) and ARIs, as well as from many years of research on case management of childhood illness.

The IMCI strategy recognizes that when children become ill, they more often than not have more than one illness. Through IMCI, WHO and UNICEF have developed a set of standard guidelines and protocols for training health workers in order to improve both the quality of care provided and communication with care-givers. Overall, IMCI has three components: improving the skills of health personnel in the prevention and treatment of childhood illness; improving the health system to deliver good-quality care; and improving family and community practices in relation to child health. The initiative is already being implemented in over 22 countries and it will be introduced in about 15 more during 1998.

Vitamin A deficiency

Vitamin A deficiency (VAD) is a major contributor to child mortality. It is estimated that about 100 million children under age of 5 in 78 countries have vitamin A deficiency (United Nations Children's Fund, 1998) and many needlessly die or go blind because of VAD. VAD increases the severity, complications and risk of death from measles and increases morbidity from diarrhoea and pneumonia. Recognizing the importance of vitamin A to child survival and development, the World Summit for Children called for virtual elimination of Vitamin A deficiency and all its consequences, including blindness, by the end of the decade.

The three main strategies for the virtual elimination of VAD are supplementation, food fortification and dietary improvement. It is a major global achievement that by mid-1997, policies supporting regular vitamin A supplementation for children had been adopted in 61 countries, up from 36 in 1994 (United Nations Children's Fund, 1998). As regards countries where children were affected by clinical vitamin A deficiency, the number that routinely provided vitamin A supplements to children also increased from 22 in 1994 to 28 in 1996 (United Nations Children's Fund, 1998).

In addition, 34 countries where VAD is a public-health problem now provide vitamin A supplements with immunizations during national immunization days. Many countries also link vitamin A supplementation to regular immunization activities or, in a few cases, to periodic deworming of children.

Overall, more than half of all young children in countries with a recognized vitamin A problem received high-dose capsules in 1996, compared with about one third in 1994. These included such large countries as Bangladesh, India, Nigeria and Viet Nam (United Nations Children's Fund, 1998).

In addition, to improve vitamin A content of breast milk, 46 countries (from both developed and developing countries) have adopted policies of routine high-dose supplementation of women within the first few weeks after they give birth, which protects their breastfeeding children for about six months. At least seven of these countries are reaching more than half of post-partum women on a regular basis.

Several countries in Latin America have chosen to address VAD through fortification. Vitamin A fortification of sugar has been practiced in Guatemala since the mid-1970s. An evaluation of 82 communities in 1990 concluded that sugar fortification had brought VAD among Guatemalan children under control. Sugar fortification has also been put into place in parts of Bolivia, Brazil and the Philippines. The success of this strategy depends on a number of factors. Those at risk of VAD need to consume centrally processed sugar regularly and in adequate quantities to make a difference, and the fortification must not put the product out of their financial reach. If these conditions are met, the approach can be an enormously effective, as the Guatemala experience has shown.

Protection, promotion and support of breastfeeding

Breastfeeding is fundamental to the survival, health, nutrition and development of children. Nonetheless, despite the strength of tradition and ample scientific evidence for the benefits of breastfeeding and the deficits associated with use of breast-milk substitutes, few children receive optimal breastfeeding, and some are not breastfed at all. Growth faltering, micronutrient malnutrition, illness and death result, a product of many factors including outdated medical practices, inappropriate marketing of artificial feeding products, inadequate access to clean water and fuel, and lack of practical, social and economic support for breastfeeding women.

Recognizing this major threat to child survival, the World Summit for Children set the goal of empowering all women to breastfeed their children adequately, "adequately" now agreed to mean "exclusively for about the first six months" for most infants, and to sustain breastfeeding with appropriate complementary feeding up to or beyond the age of two years. The WHO/UNICEF baby-friendly hospital initiative (BFHI) encourages and supports exclusive breastfeeding, ensuring that all mothers can choose how to feed their infants with a basis of full information, supportive practices, and skilled help from health workers. Uniformly in all nations strict global criteria are applied by external assessors before a facility can achieve baby-friendly status. These criteria include the facility's refusal of free or low-cost supplies of breast-milk substitutes and feeding bottles.

As a result of concerted efforts, especially by the maternity staff who have accomplished dramatic improvements in care, over 12,700 facilities in 114 countries have been designated baby-friendly. Another 49 countries are working towards their first hospital designation. The largest number of baby-friendly hospitals are in Eastern Asia and the Pacific (8,294), followed by South Asia (1,287) and Latin America and the Caribbean (998). Industrialized nations and the newly independent States of the former Soviet Union together have 262 baby-friendly facilities as of August 1997 (United Nations Children's Fund, 1998).

With WHO and non-governmental organizations as partners, UNICEF has collaborated in the development and publication of three levels of courses that train health workers to help mothers breastfeed. Up-to-date materials are now available in all United Nations languages and many other languages, and these support specialized training ranging in length from three days for maternity staff members to four weeks for senior trainers and medical school faculty members,. Conservatively estimated, the number of health workers trained for the BFHI and other breastfeeding programmes exceeds 1 million.

Globally, more than 100 countries have taken national action to prevent the distribution of free or low-cost supplies of breast-milk substitutes through health facilities. However, this is only one of the marketing practices that undermine breastfeeding. Greater protection is needed, through full implementation of the International Code of Marketing of Breast-milk Substitutes and subsequent World Health Assembly resolutions. UNICEF works with Governments to advocate for global implementation and enforcement of the Code at national levels. Government counterparts and non-governmental organizations have been trained, and technical assistance has been provided in drafting legislation that conforms to the minimum standard set by the Code and WHO resolutions. At present 16 nations have the Code as law, and another 43 have some provisions as law; some 70 others are in the process of working towards national codes. Public communication and advocacy for breastfeeding have been carried out in collaboration with many Governments and non-governmental organizations. World Breastfeeding Week, spearheaded by the UNICEF-supported consortium World Alliance for Breastfeeding Action (WABA), has been taken up by most nations as a focus for celebration of accomplishments, advocacy for greater progress, and international linkage.

Child malnutrition

An estimated 183 million under-five children in the developing countries are malnourished, measured by weight-for-age. Some 226 million are estimated to be stunted (United Nations Children's Fund, 1998). A meta-analysis funded by UNICEF, the results of which were endorsed by WHO, concluded that globally malnutrition contributes to about 56 per cent of under-five mortality, both directly and indirectly through lowering resistance to infectious illness. Malnutrition also results in poor physical and cognitive development and generally occurs in tandem with particular vitamin and mineral deficiencies. There is increasing evidence to suggest that malnutrition in the early years of life increases the risk in adulthood of diabetes, cardiovascular disease and other chronic illnesses.

The World Summit for Children set the year 2000 goal of reducing severe and moderate malnutrition among under-five children by half of 1990 levels. Although enormous progress has been made in reducing child malnutrition in many countries, globally the rate of malnutrition appears to have stagnated since about 1990, with approximately 31 per cent of under-five children being underweight for age. On a regional level, Eastern Asia and the Pacific, Latin America and the Caribbean, and some countries of Western Asia and Northern Africa have achieved significant declines. However, in sub-Saharan Africa and South Asia the number of malnourished children continues to increase on the regional level in spite of successes in some countries (United Nations Children's Fund, 1998).

Some of the most successful country programmes to address the problem of malnutrition, such as those in the Niger and in the United Republic of Tanzania, rely on participatory community-level problem assessment and analysis, often using growth monitoring and promotion, and formulation of priority actions. UNICEF has worked with local-level facilitators in many countries to ensure that nutrition outcomes are well understood to be the result of families' access to food and health services as well as their ability to translate basic services and resources into appropriate care for children and women.

Experience in some countries has shown that in spite of relatively good access of households to health services and to adequate food, child malnutrition rates remain high. One reason may be inadequate care practices in the household, and inadequate resources or support for adequate care at community and governmental levels. Inadequate care for young children can compromise their growth, development and, ultimately, their survival. "The Care Initiative: Assessment, Analysis and Action to Improve Care for Nutrition", developed by UNICEF, deals with six aspects of the care necessary for good growth and development of children under age 3, that are synergistic with household food security and health services and a healthy environment. These are special care for women, breastfeeding and other child feeding practices, psychosocial care of women and children, improved food preparation, improved hygiene practices, and improved home health practices.

Through the process of analysis that this instrument encourages at national level, countries identify both their constraints and their resources as regards improved care for women and for children under age 3, as a foundation for effective programming. This initiative is being pursued in a number of countries, including Brazil, India, Indonesia, Lesotho, Pakistan and Viet Nam.

An essential part of the focus on care is young child feeding, including a focus on foods that complement breast milk after the age of about 6 months. Many programmes over the last three decades have endeavoured to improve the quality of complementary foods (sometimes called weaning foods), but success has not always been easy. Research on nutrient needs of young children has advanced rapidly in recent years, particularly in the area of micronutrients, and indicates that some past programmes may have been technically flawed.

Iodine deficiency disorders

There is good evidence to suggest that in areas with high rates of endemic iodine deficiency, improving iodine status of children improves their survival. It has been established for decades that improving iodine status of women before or during pregnancy also reduces the risk of stillbirth and miscarriage. Iodine deficiency disorders (IDDs) are more widely known to be associated with congenital mental retardation, including cretinism. In 1990, it was estimated that about 1.6 billion people were at risk of irreversible mental retardation and the other consequences of IDD (United Nations Children's Fund, 1998). Some 750 million people suffered from goitre at that time, mainly because of low iodine intake, and 43 million were estimated to be affected by irreversible brain damage.

The World Summit for Children recognized the importance of universal salt iodization (USI) in addressing the above issues and called for virtual elimination of IDD by the year 2000 with USI as a principal strategy.

The reduction in IDD that has occurred since 1992 is a global success story by any standard. It is estimated that nearly 55 per cent of all edible salt in the world is now iodized, up from about 12-15 per cent in 1990 (United Nations Children's Fund, 1998). Some 27 countries that had IDD problems in 1990 now iodize over 90 per cent of edible salt (or import that proportion if they are not salt producers) and another 15 countries iodize between 75 and 90 per cent of their salt. As late as 1994, 48 countries with established IDD problems had no programmes at all. Of these, 14 now iodize more than half their salt. All but seven of the affected countries have appropriate legislation to ensure USI.

At the level of children and their families, these results, though still incomplete, are improving lives. It is estimated that about 40 million children were born in 1990 with irreversible mental retardation caused by IDD. In 1997, that figure was probably closer to 28 million — still too high, but representing a clear and rapid decrease in the number of children affected. It is difficult to estimate the number of cretins born each year, but in 1990 the number was probably on the order of 100,000 and is probably about half that now. It is impossible to measure the impact on miscarriages, which are rarely well reported in health statistics, but the improvements are surely noticeable by affected women and their families (United Nations Children's Fund, 1998).

2. *Remaining challenges*

Despite the significant gains made over the past few decades, childhood mortality risks remain high throughout the developing world, particularly in sub-Saharan Africa and South Asia. Most of these deaths are from preventable causes. Diarrhoea and acute respiratory infections together account for 38 per cent, vaccine-preventable causes for 13 per cent, and neonatal and perinatal causes for almost 18 per cent, exacerbated in more than half the cases by malnutrition.

About 44 per cent of developing countries — with about two thirds of the under-five population — will fall short of the end-of-decade goals of the World Summit for Children unless their efforts are significantly strengthened. Though the industrialized nations and countries in Northern Africa and Western Asia have performed well when measured against the Summit's goals, most sub-Saharan African and South Asian nations have done poorly. Over 80 per cent of sub-Saharan African countries and 75 per cent of South Asian countries are falling short of achieving the Summit's goals.

Furthermore, the goals of making further large reductions in childhood mortality and sickness are endangered by a host of factors. Few low-cost and effective interventions are available to tackle the causes of neonatal and perinatal mortality. AIDS has eroded or reversed many hard-won gains in sub-Saharan Africa, and now threatens South and South-eastern Asia. Particularly worrisome is the fact that some of the underlying causal factors of childhood ill health and mortality are becoming increasingly adverse. Persisting economic crisis and deepening poverty in many African nations increase the risks to children of ill health or death. These factors mean that dramatic improvements in child health will be more difficult to achieve than in the recent past.

To sustain existing gains and to progress further in securing child and maternal health requires action on many fronts:

(*a*) Programmes on immunization, ORT, breastfeeding support, vitamin A and iodine deficiency — crucial to under-five mortality reduction — can be sustained only if they continue to receive priority and are better integrated into health services and community-based activities;

(*b*) The control of malaria needs to be made a priority, given its devastating toll on young children, especially in Africa. Reducing sickness and mortality from malaria will hinge on community education and participation, better supplies of drugs and improved case management, and the provision of impregnated bed-nets;

(*c*) The IMCI programme needs to be recast, based on the lessons learned from the successful immunization and ORT effort, so as to be focused more at the household and community levels;

(*d*) HIV/AIDS preventive interventions have to be rapidly expanded and strengthened;

(*e*) Programmes to reduce malnutrition and micronutrient deficiencies must continue to draw the resources and best strategic practices of all sectors.

The success of interventions such as those described above also hinges on achieving progress in several cross-cutting areas. Experience has shown that community and household participation is crucial to child survival activities. The quality of health services has to be improved. District health systems need to be decentralized and strengthened. Health services and programmes must reach inaccessible and vulnerable groups. Gender bias in household care and in health services must be remedied. Facilitating these conditions is imperative for the sustenance of child health action.

Notes

[1]BCG stands for Bacillus Calmette-Guérin, an attenuated strain of *mycobacterium bovis* a bacillus that causes tuberculosis in cows.

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IV. WOMEN'S HEALTH AND SAFE MOTHERHOOD*

A. INTERNATIONAL GOALS RELATED TO MATERNAL MORTALITY REDUCTION

The Programme of Action of the International Conference on Population and Development formulated two overriding objectives in relation to women's health and safe motherhood, namely:

"(*a*) To promote women's health and safe motherhood; to achieve a rapid and substantial reduction in maternal morbidity and mortality and reduce the differences observed between developing and developed countries and within countries. On the basis of a commitment to women's health and well-being, to reduce greatly the number of deaths and morbidity from unsafe abortion;

"(*b*) To improve the health and nutritional status of women, especially of pregnant and nursing women" (United Nations, 1995, chap. I, resolution 1, annex, para. 8.20).

The Programme of Action required that countries strive to effect significant reductions in maternal mortality by the year 2015: a reduction in maternal mortality by one half of the 1990 levels by the year 2000 and a further reduction by one half by 2015 (see box 5). This implies a reduction in global levels of maternal mortality from 430 per 100,000 live births in 1990 to 215 per 100,000 live births by the year 2000 and to 108 per 100,000 live births by 2015 (see table 21). The Programme of Action also drew attention to the importance of reducing disparities in maternal mortality within countries and between geographical regions, and socio-economic and ethnic groups. The achievement of these goals implies averting over 5 million maternal deaths over the period 1990-2015.

B. EXTENT AND DIMENSIONS OF MATERNAL MORTALITY

Currently, complications related to pregnancy and childbirth are among the leading causes of mortality for women of reproductive age in many parts of the developing world. Available data are limited because of the almost complete absence of vital registration systems with adequate attribution of cause of death. Evidence from community and sisterhood studies around the world shows that in some developing countries one third or more of deaths of women of reproductive age may be pregnancy-related, compared with generally less than 1 per cent in developed countries (table 22).

TABLE 21. ESTIMATED LEVELS OF MATERNAL MORTALITY BY 2000 AND 2015 IF THE GOALS OF THE PROGRAMME OF ACTION OF THE INTERNATIONAL CONFERENCE ON POPULATION AND DEVELOPMENT ARE ACHIEVED

(Maternal deaths per 100,000 live births)

Major area or region	*1990*	*2000*	*2015*
World	430	215	108
More developed regions	27	14	7
Less developed regions	480	240	120
Africa	870	435	218
Asia	390	195	98
Europe	36	18	9
Latin America and the Caribbean	190	95	48
Northern America	11	6	3
Oceania	680	340	170

*Prepared by the World Health Organization, Geneva.

BOX 5. GOALS IN TERMS OF LEVELS OF MATERNAL MORTALITY AGREED UPON AT UNITED NATIONS CONFERENCES AND SUMMITS

International Conference on Population, 1984: "Governments are urged to reduce maternal mortality by at least 50 per cent by the year 2000, where such mortality is very high (higher than 100 maternal deaths per 100,000 births)."[a]

The World Summit for Children, 1990: "Between 1990 and the year 2000, reduction of maternal mortality rate by half."[b]

International Conference on Population and Development, 1994: "Countries should strive to effect significant reductions in maternal mortality by the year 2015: a reduction in maternal mortality by one half of the 1990 levels by the year 2000 and a further one half by 2015. The realization of these goals will have different implications for countries with different 1990 levels of maternal mortality. Countries with intermediate levels of mortality should aim to achieve by the year 2005 a maternal mortality rate below 100 per 100,000 live births and by the year 2015 a maternal mortality rate below 60 per 100,000 live births. Countries with the highest levels of mortality should aim to achieve by 2005 a maternal mortality rate below 125 per 100,000 live births and by 2015 a maternal mortality rate below 75 per 100,000 live births."[c]

World Summit for Social Development, 1995: "Governments should implement the commitments that have been made to meet the basic needs of all ... including, *inter alia*, the following: by the year 2000, a reduction in maternal mortality by one half of the 1990 level; by the year 2015, a further reduction by one half."[d]

Fourth World Conference on Women, 1995: "Reduce ill health and maternal morbidity and achieve worldwide the agreed upon goal of reducing maternal mortality by at least 50 per cent of the 1990 levels by the year 2000 and a further one half by the year 2015."[e]

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[a] *Report of the International Conference on Population, 1984, Mexico City, 6-14 August 1984* (United Nations publication, Sales No. E.84.XIII.8 and corrigenda), chap. I, sect. B, recommendation 18.

[b] United Nations Children's Fund, *First call for Children* (New York, UNICEF, 1990), *Plan of Action for Implementing the World Declaration on the Survival, Protection and Development of Children in the 1990s*, appendix): Goals for children and development in the 1990s, Goal I (b).

[c] *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, para 8.21.

[d] *Report of the World Summit for Social Development, Copenhagen, 6-12 March 1995* (United Nations publication, Sales No. E.96.IV.8), chap. I, resolution 1, annex II, para. 36.

[e] *Report of the Fourth World Conference on Women, Beijing, 4-15 September 1995* (United Nations publication, Sales No. E.96.IV.13), chap. I, resolution 1, annex II, para. 106 (I).

TABLE 22. MATERNAL DEATHS AS A PROPORTION OF ALL DEATHS AMONG WOMEN OF REPRODUCTIVE AGE: SELECTED COMMUNITY-BASED STUDIES

Country and area	*Year of study*	*Proportion maternal of deaths of women of reproductive age (percentage)*
Bangladesh, Matlab Thana	1976-1985	37
Morocco[a]	1980	29
Indonesia, Bali	1980-1982	23
Egypt, Menufia	1981-1983	23
India, Andhra Pradesh urban	1985-1985	38
India, Andhra Pradesh rural	1984-1985	28
Guinea-Bissau	1989-1990	41
Honduras	1990	22
United Kingdom[b]	1992	0.7

Sources: M. A. Koenig and others, "Maternal mortality in Matlab", in *Studies in Family Planning*, vol. 19, No. 2 (Bangladesh, 1988), pp. 31-21; Demographic Health Services, *Enquete nationale sur la population et la santé au Maroc (ENPS-II)*, Ministère de la Santé Publique and Demographic and Health Surveys, (Calverton, Maryland, Macro International, Inc., 1992); A. Fortney and others, "Maternal mortality in Indonesia and Egypt", paper presented at the Interregional Meeting on the Prevention of Maternal Mortality, Geneva, 11-15 November 1985 (unpublished WHO document FHE/PMM/85.9.13); S. Gadalla, Reproductive age mortality survey (unpublished data, 1984); J. C. Bhatia, Maternal mortality: a South Indian study, in *Maternal and infant mortality - Closing the Gap between Perinatal Health Services: Proceedings of the Fourth International Congress for Maternal and Neonatal Health*, E. Kessel and others, eds. (Bandung, Indonesia, 1991); M. Osterbaan and M. V. Barreto da Costa, A mortalidad materna na Guinea-Bissau (unpublished report to the Maternal Health and Safe Motherhood Programme, WHO, 1991); Pan American Health Organization, Evaluación del plan regional para la reducción de la mortalidad materna en las Americas: informes de los paises (Washington, D.C., 1995); World Health Organization, *World Health Statistics Annual, 1994* (Geneva, 1994).

[a]Sisterhood study.

[b]Civil registration data.

At the global level, revised 1990 estimates of maternal mortality issued in 1996 indicate that about 585,000 women die each year of pregnancy-related causes, 99 per cent of them in developing countries (table 23). The gap in maternal mortality ratios between developed and developing regions is wide: in 1990, it ranged from an average of 480 per 100,000 live births in the less developed countries to about 27 per 100,000 live births in the developed regions. In parts of Africa, ratios can be as high as 1,000 per 100,000 live births.

The maternal mortality ratio represents a measure of the obstetric risk, that is to say, the risk of pregnancy-related death associated with each pregnancy. Where women have many pregnancies, the risk of pregnancy-related death over the course of a lifetime is compounded and the disparities between developed and developing regions is shown even more dramatically. In Africa, the lifetime risk is about 1 in 16, compared with 1 in 65 in Asia, 1 in 130 in Latin America and the Caribbean and 1 in 1,400 in Europe (see table 23).

TABLE 23. REVISED 1990 ESTIMATES OF MATERNAL MORTALITY BY REGION

	Maternal mortality ratio (maternal deaths per 100,000 live births)	*Number of maternal deaths*	*Lifetime risks of maternal death: 1 in*
World total	430	585 000	60
More developed regions[a]	27	4 000	1 800
Less developed regions	480	582 000	48
Africa	870	235 000	16
Eastern Africa	1 060	97 000	12
Middle Africa	950	31 000	14
Northern Africa	340	16 000	55
Southern Africa	260	3 600	75
Western Africa	1 020	87 000	12
Asia[a]	390	323 000	65
Eastern Asia	95	24 000	410
South-central Asia	560	227 000	35
South-eastern Asia	440	56 000	55
Western Asia	320	16 000	55
Europe	36	3 200	1 400
Eastern Europe	62	2 500	730
Northern Europe	11	140	4 000
Southern Europe	14	220	4 000
Western Europe	17	350	3 200
Latin America and the Caribbean	190	23 000	130
Caribbean	400	3 200	75
Central America	140	4 700	170
South America	200	15 000	140
Northern America	11	500	3 700
Oceania[a]	680	1 400	26
Australia-New Zealand	10	40	3 600
Melanesia	810	1,400	21

Source: World Health Organization/United Nations Children's Fund, *Revised 1990 Estimates of Maternal Mortality* (Geneva, 1996).

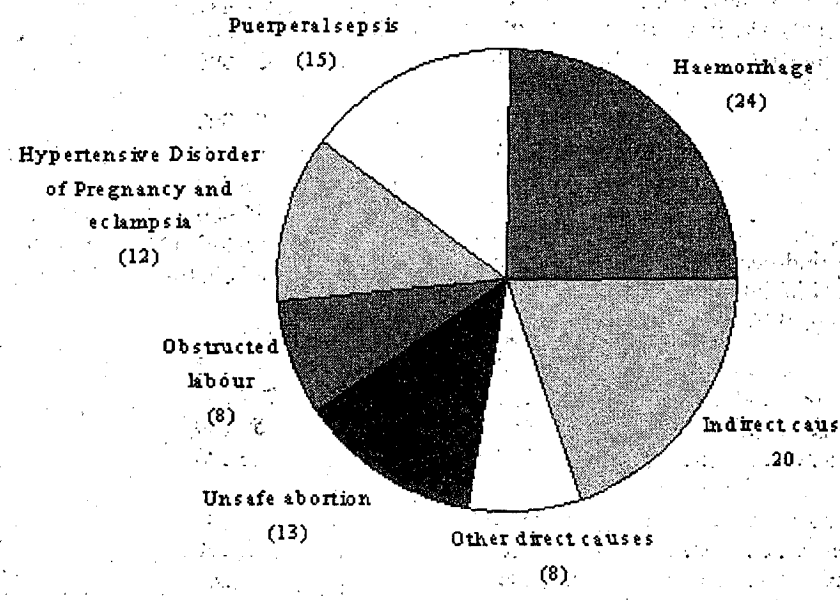
[a]Australia, New Zealand and Japan being excluded from the regional totals but included in the total for the more developed regions.

C. CAUSES OF MATERNAL DEATHS

The causes of maternal deaths are similar about the world. Globally, about 80 per cent of such deaths have direct causes, that is to say, they are due to obstetric complications of the pregnant state (pregnancy, labour and the puerperium), arising from interventions, omissions, incorrect treatment or a chain of events resulting from any of these. The single most common direct cause of death — accounting for a quarter of all maternal deaths — is obstetric haemorrhage, generally occurring post-partum (see figure 13). Post-partum haemorrhage is unpredictable, sudden in onset and swift to kill. It can lead to death very rapidly in the absence of appropriate and prompt life-saving care which includes the administration of drugs to control the bleeding and, where needed, blood transfusion. Puerperal infections, often the consequence of poor hygiene during delivery or untreated reproductive tract infections (including those that are sexually transmitted), account for some 15 per cent of maternal mortality. Yet such infections can be easily prevented by ensuring hygienic deliveries and detection and management of reproductive tract infections during pregnancy. Hypertensive disorders of pregnancy, particularly eclampsia (convulsions), result in some 12 per cent of all maternal deaths. Deaths from hypertensive disorders can be prevented through careful monitoring during pregnancy and treatment with relatively simple anticonvulsant drugs in cases of eclampsia. About 8 per cent of maternal deaths occur as a re-

Figure 13. Estimated causes of maternal deaths worldwide, 1993

(Percentage)



Source: World Health Organization, Mother-Baby Package: Implementing Safe Motherhood in Countries (Geneva, 1994), WHO/FHE/MS/94.11.

sult of prolonged or obstructed labour. This is often caused by cephalo-pelvic disproportion (in this situation, the infant's head cannot pass through the maternal pelvis) or by abnormal lie. Disproportion is more common in populations where malnutrition is endemic, especially, in those where girls and women by tradition eat last and least, and is exacerbated when girls marry young and are expected to prove their fertility during adolescence, often before they are fully grown. Other direct causes of maternal deaths include ectopic and molar pregnancies, embolisms and deaths related to interventions such as anaesthesia.

A substantial proportion of maternal deaths result from complications associated with unsafe abortion.[1] In some parts of the world, as many as one third or more of all maternal deaths are associated with unsafe abortions. The Programme of Action of the International Conference on Population and Development recognizes unsafe abortion as a major public-health issue and recommends that the recourse to abortion be reduced through expanded and improved family-planning services. The Programme of Action stresses further that in circumstances where abortion is not against the law, such abortion should be safe. In all cases, women should have access to quality services for the management of complications arising from abortion. At present, approximately 90 per cent of the countries of the world, representing 96 per cent of the world population, have policies that permit abortion under varying legal conditions to save the life of a woman. However, a significant proportion of the abortions carried out are self-induced or otherwise unsafe, leading to a large fraction of maternal deaths or to permanent injury to the women involved.

About 20 per cent of maternal deaths have indirect causes, that is to say, they are the result of previously existing disease or disease that developed during pregnancy. Such a disease does not have a direct obstetric cause, but is aggravated by the physiological effects of pregnancy. Of these indirect causes of death, one of the most significant is anaemia which can cause death through cardiovascular arrest and is also an underlying factor in a substantial proportion of direct deaths (particularly those caused by haemorrhage and sepsis). Other important indirect causes of death include hepatitis, cardiac diseases, diseases of the endocrine or metabolic system, and diseases of the central nervous system.

D. Pregnancy-related morbidity and disabilities

More is known about the dimensions of maternal mortality than about the incidence and prevalence of pregnancy-related morbidity and disabilities. Over recent years, innovative research methodologies have been developed to attempt to quantify the burden of such morbidity. However, all such methods are hampered by the need for clinical and laboratory examinations in order to assess the nature and severity of the morbidity; in this field as in other areas of ill health, self-reporting is not a reliable guide to the true extent of the problem.[2] Moreover, at the global level, relatively few studies have been undertaken and for the vast majority of countries and areas, there is no reliable information on the incidence, prevalence or severity of the major pregnancy-related morbidities and disabilities. The studies that have been carried out indicate a problem of considerable magnitude (Fortney, 1997).

In an effort to bring together the disparate types of information on pregnancy-related morbidity, WHO has made estimates of the dimensions of the problem on the basis of evidence about the incidence of major obstetric complications, case-fatality rates, and clinical and epidemiological judgement as to the dimensions and nature of the main sequelae. This information is summarized in table 24. This analysis is limited to the five main direct causes of maternal mortality and the major morbidities associated with each (haemorrhage, puerperal infection, eclampsia, obstructed labour and unsafe abortion). Thus, the data presented here do not include morbidities arising from other direct causes of maternal death (such as ectopic pregnancy) or from indirect causes (such as cardiovascular diseases or diabetes) with the exception of anaemia which has been included as an outcome of severe haemorrhage.

Little information is available from developing countries on the incidence of post-partum haemorrhage. Even within an institutional setting, underestimation of blood loss is very common. In parts of the world where a large proportion of deliveries takes place in the home with the assistance of family members or traditional birth attendants, such underestimation is likely to be even greater. Indeed, many cultural beliefs welcome major post-partum blood loss as a form of cleansing and purification. In such circumstances, there will be long delays before women and their attendants seek skilled assistance (Mutambirwa, 1984; Ryan, 1981; Thompson, 1996). A recent World Health Organization (WHO) technical working group concluded that about 5 per cent of women delivering vaginally lose more than 1,000 cubic centimetres (cc) of blood (World Health Organization, 1996). WHO estimates that some 10 per cent of all deliveries are complicated by post-partum haemorrhage (World Health Organization, 1994).

The major disability resulting from non-fatal haemorrhage is Sheehan's syndrome, post-partum pituitary necrosis following obstetric shock. The clinical symptoms include chronic weakness, premature old age, amenorrhoea, loss of pubic hair and mental changes including apathy and confusion. Because of the apathy induced by the disease, few women with such symptoms consult a doctor and the only way to estimate its extent would be to conduct detailed community-based studies. WHO estimates that there may be as many as 114,000 cases annually worldwide.

A more common complication of haemorrhage is anaemia. A woman with a normal haemoglobin level at the end of pregnancy who suffers even a normal blood loss of less than 500 cc will subsequently need to make good the loss if she is to avoid becoming anaemic. Where pregnant women are already anaemic, post-partum haemorrhage is likely to ag-

Table 24. Incidence, case fatality, and cause-specific mortality rates due to major direct obstetric complications, 1990

	Incidence of major direct obstetric complications (as a percentage of live births)	*Case fatality (deaths as a percentage of complications)*	*Cause-specific mortality (per per 100,000 live births)*
Haemorrhage	10	1.0	105
Puerperal sepsis	8.5	0.8	65
Hypertensive disorders of pregnancy and eclampsia	5.0	1.1	55
Prolonged and obstructed labour	5.0	0.6	35
Unsafe abortion	14.0	0.4	55
Other direct causes	2.5	1.2	30
Total direct causes	45	0.8	340
Indirect causes	10	0.9	85
TOTAL	55	0.8	430

Source: World Health Organization, Maternal and Newborn Health/Safe Motherhood Programme (Geneva), unpublished estimates.

NOTE: Figures may not add to totals due to rounding.

gravate the anaemia and may even be fatal. Of the 14 million cases of post-partum haemorrhage which occur every year, it is reasonable to assume that half will occur to women who are already anaemic (since it is estimated that over half of all pregnant women are anaemic (World Health Organization, 1992). Thus, a total of 7 million cases of moderate or severe anaemia will occur each year. With each subsequent pregnancy, these women are exposed to an ever-increasing risk of serious disability or death.

Puerperal infections are an important cause of morbidity and mortality among post-partum women in developing nations. The infected woman, in acute stages, suffers pain and illness. Her condition may eventually result in infertility, chronic debilitation or death. The incidence of puerperal infections in developing countries is not accurately known. In the United States of America, from 1 to 7 per cent of post-partum women develop a puerperal infection (Eschenbach and Wager, 1980). Prospective surveillance study by Sweet and Ledger (1973) of over 6,000 post-partum women in the United States indicated an infection rate of nearly 6 per cent. A study from Zaria, Nigeria, reported a rate of post-partum genital sepsis of 7.9 per cent (Harrison and Rossiter, 1985). However, the rate rose to 14.9 per cent among women who had delivered at home. In a maternity hospital in Nairobi, Kenya, 20 per cent of women developed a post-partum upper genital tract infection (Plummer and others, 1987). Various reports have indicated considerably higher rates of infection following delivery by Caesarean section than following vaginal delivery. A report from the Congo found that post-Caesarean infection had caused one third of all maternal deaths in two urban areas (Locko-Mafouta and others, 1988). A study in Ghana found that infection occurred in 60 per cent of women who had had Caesarean deliveries compared with less than 2 per cent of women who had had vaginal deliveries. WHO estimates that rates of incidence of puerperal sepsis range from a high of 10 per cent in sub-Saharan Africa to a low of 5 per cent in developed countries (World Health Organization, 1994).

Global information about the long-term sequelae of puerperal sepsis and its associated complications is scarce. However, it is known that puerperal infection may lead directly to conditions such as ectopic pregnancy, chronic pelvic pain and infertility. Chronic or acute pelvic inflammatory disease (PID) is caused by the spread of the infection upwards through the genital tract, causing damage to the Fallopian tubes and ovaries. Chronic PID causes widespread damage to the reproductive system and often leads to irreversible infertility. Uterine infection may extend by way of the lymphatics to the abdominal cavity and cause peritonitis. Women whose Fallopian tubes are damaged by infection are more at risk of a second tubal infection and more likely to become infertile when a further episode of PID occurs. Few community-based studies in developing countries have examined the prevalence of reproductive tract infections and associated infertility. A rare study in rural Egypt found that 51 per cent of the women had reproductive tract infections, and PID was suspected in 20 per cent of all women (Younis and others, 1993). A similar study in Lahore, Pakistan, found a 3 per cent incidence of PID and a 5 per cent incidence of infertility (Awan and others, 1994). A study in rural Nigeria found a prevalence of reproductive tract infections in women aged 20 years or over 23 per cent and a prevalence of PID of 9 per cent; among adolescents in this study, the prevalence was 40 per cent and 4 per cent respectively (Brabin and others, 1995).

There are very few population-based studies on the frequency with which hypertensive disorders and eclampsia occur in pregnancy. Most reports on the epidemiology of the condition have dealt with the occurrence of eclampsia (convulsions). Rates of eclampsia at about 0.1 per cent have been reported from about the world (Australia, Canada, France, Germany, Israel, the Netherlands, New Zealand, Switzerland and the United Kingdom of Great Britain and Northern Ireland) from 1950 onwards (MacGillivray, 1983). Over the same period, much higher rates (10-17 per cent) have been recorded in India, Italy, the Republic of Korea and Nigeria (Moodley and Dava, 1994; Poropakkham, 1979). In order to determine more accurately the epidemiology of hypertensive disorders and eclampsia in different settings, WHO sponsored an interregional collaborative study, the findings of which were issued in 1991 (World Health Organization, 1991). On the basis of this and other studies, WHO estimates an incidence of eclampsia of 0.5 per cent of live births for the developing countries. Eclampsia, though uncommon, has a high case-fatality rate. Pre-eclampsia affects many vital organ systems. Renal and liver damage, pulmonary oedema, cerebral haemorrhage and retinal detachment may follow eclamptic convulsions. It is not clear to what extent these conditions are temporary, and very little long-term follow-up of women who have suffered from eclamptic convulsions has been undertaken. A study in Nigeria found that of 741 eclamptic survivors, 65 (8.8 per cent) had associated complications including acute renal failure (22 women), cerebrovascular haemorrhage (6 women) and acute cardiopulmonary failure (5 women); 32 women had other acute conditions including haemorrhage, sepsis and ruptured uterus (Odum, 1991). A follow-up study in the United States followed a total of 223 women with eclampsia for an average of 7.2 years (Sibai and others, 1992). Twenty of the women (8.9 per cent) developed chronic hypertension following the index pregnancy though they gave no evidence of pre-existing hypertension. WHO has estimated that 10 per cent of all eclamptic survivors are left with a degree of permanent impairment. In respect of these instances of impairment, 90 per cent can be classified as mild and 10 per cent as serious.

Information on the incidence of prolonged or obstructed labour is incomplete and patchy. Any case of prolonged labour will normally require some form of obstetric intervention if it is to be brought to a successful outcome. Cephalo-pelvic disproportion or abnormal lie will require instrumental or Caesarean delivery. WHO estimates that the incidence of prolonged or obstructed labour varies over a narrow interval, ranging from a minimum of 3 per cent to a high of 6 per cent (World Health Organization, 1994). The lower figure is assumed to apply in more developed areas and in those where early marriage and childhood malnutrition, especially among girls, are not widespread. The high figure is applicable to Africa, and South-central and Western Asia.

By far the most severe and distressing long-term condition following obstructed labour is obstetric fistula, which is a hole that forms in the vaginal wall communicating with the bladder (vesico-vaginal fistula) or in the vaginal wall communicating with the rectum (rectovaginal fistula) or in both walls. In developing countries, fistulas are commonly the result of prolonged obstructed labour and follow pressure necrosis caused by impaction of the presenting part during difficult labour. The immediate consequences of such damage are urinary incontinence, faecal incontinence if the rectum is affected, and excoriation of the vulva from the constantly leaking urine and faeces. Secondary amenorrhoea is a frequently associated problem. The true incidence of obstetric fistula is very difficult to determine because it is a result of poor or absent obstetric care associated with a range of social conditions such as lack of health services, early marriage, seclusion of women and socio-economic deprivation. It has been estimated that incidence of fistulas probably ranges between 50 and 80 per 100,000 births (World Health Organization, 1989).

In addition to the immediate consequences of poorly managed obstructed labour such as fistulas or ruptured uterus, prolonged obstructed labour can cause less severe, though chronic, disabilities even in areas where obstetric interventions are available. Perineal trauma is a common result of prolonged and obstructed labour and may cause discomfort to a degree that can dominate the experience of early motherhood and result in significant disability during the months and years that follow. Although there is debate about the extent to which stress incontinence is caused or aggravated by vaginal delivery, it is generally agreed that such sequelae are particularly likely to occur where delivery has been prolonged or difficult. Prolonged labour is more likely to result in injury to the pelvic floor muscles and ligaments or to their nerve supply or to the interconnecting fascia. This in turn may cause uterine or vaginal wall prolapse or stress incontinence. The evidence indicates that even in developed countries with high standards of obstetric care, about 6 per cent of first-time mothers and 10 per cent of multiparous mothers have stress incontinence at the six weeks' post-natal check-up.

The long-term consequences of unsafe abortion may include chronic pelvic pain, PID, tubal occlusion and secondary infertility. High incidence of ectopic pregnancy and premature delivery, and increased risks of spontaneous abortion in subsequent pregnancies are other possible consequences of unsafe abortions, particularly where sexually transmitted infections are present (Moller and others, 1982; Giertz and others, 1987; Westergaard and others, 1982; Osser and Persson, 1984). Extrapolations from these and other studies indicate that about 20-30 per cent of unsafe abortions may lead to reproductive tract infections of which between 20 and 40 per cent lead to PID and infertility.

The likelihood that infection will develop subsequent to an unsafe abortion depends on the abortion method, who induced the abortion, the environment in which it took place and the general health status of the abortion seeker. It will also depend on the factors of access to health facilities as well as of engagement in health-seeking behaviour should complications occur. WHO estimates that between 20 and 30 per cent of unsafe abortion procedures result in reproductive tract infections, the upper range applying to the regions with high incidence of unsafe abortion using methods that may introduce infectious agents and/or with poor availability of hospital and medical care, namely, sub-Saharan Africa and India. Depending on external factors, in particular the accessibility and use of health services, between 20 and 40 per cent of such reproductive tract infections are estimated to develop into bilateral tubal occlusion and infertility.

The present summary of the disabilities resulting from the major complications of pregnancy should not be regarded as a comprehensive account of the epidemiology of pregnancy-related morbidity. A comprehensive coverage of the burden of morbidity would need to address all direct and indirect complications as well as at least a proportion of so called "fortuitous" causes and psychological conditions related to pregnancy and childbirth.

Conditions may indirectly result from existing diseases such as anaemia, malaria, hepatitis, tuberculosis, and cardiovascular disorders that are aggravated by the physiological effects of pregnancy. Indirect obstetric morbidity may occur at any time and continue beyond the reproductive period. Although in the past mortality and morbidity arising from "fortuitous" or "accidental" causes were not included under pregnancy-related causes of death or disability, more recently — because of the difficulty in distinguishing between conditions that are exacerbated by pregnancy and those that are not, and in determining whether external causes (suicide, violence) are pregnancy-related — it has been proposed that this category be included under maternal mortality and morbidity. The category of psychological obstetric morbidity includes puerperal psychoses, post-partum depression (baby blues), suicide and strong fear of pregnancy and childbirth that may be the result of obstetric complications, or interventions of cultural practices.

E. Interventions to reduce maternal mortality and morbidity

The immediate cause of pregnancy-related complications, ill health and death is inadequate care of the mother during pregnancy and delivery. More distal factors include women's subordinate status, poor health and inadequate nutrition. The age at which women begin or stop child bearing, the interval between each birth, the total number of lifetime pregnancies and the sociocultural and economic circumstances in which women live all influence maternal morbidity and mortality. However, the single most important proximate determinant of maternal health and survival is the extent to which women have access to and utilize high-quality maternal health care services. This was explicitly recognized in the Programme of Action of the International Conference on Population and Development which states: "All countries, with the support of all sections of the international community, must expand the provision of maternal health services in the context of primary health care. These services, based on the concept of informed choice, should include education on safe motherhood, prenatal care that is focused and effective, maternal nutrition programmes, adequate delivery assistance that avoids excessive recourse to Caesarean sections and provides for obstetric emergencies;

referral services for pregnancy, childbirth and abortion complications; post-natal care and family planning. All births should be assisted by trained persons, preferably nurses and midwives, but at least by trained birth attendants" (United Nations, 1995, chap. I, resolution 1, annex, para. 8.22).

WHO has defined a minimal package of essential maternal health care interventions that should be provided through maternal health services (World Health Organization, 1994). These interventions could, if applied comprehensively in all developing countries, help to ensure the attainment of the goals of the Programme of Action. However, this will mean ensuring that all pregnant women have access to and use quality maternal health care services during pregnancy, childbirth and the post-partum period.

F. Access to quality maternal health care services

While any woman can develop complications during pregnancy and delivery, many such complications can be prevented or treated before they become life-threatening emergencies by appropriately trained and equipped health-care providers. Interventions that are beneficial to mothers help babies too. Throughout pregnancy, childbirth and the post-partum period, women need access to a person with the skills to prevent, detect and manage the major obstetric complications together with the equipment, drugs and supplies to treat them effectively.

Ensuring access to maternal health care is a complex challenge because maternal care is needed for a variety of conditions over an extended period of time. The nature of pregnancy-related care differs according to the stage in the pregnancy. Broadly speaking, there are four distinct periods during which women need care:

(*a*) Early in the pregnancy for abortion-related care;

(*b*) Throughout pregnancy for prenatal care;

(*c*) During childbirth;

(*d*) During the post-partum period when care for both mother and infant is needed.

The prenatal period lasts nine months and women with normal pregnancies can receive prenatal care at any time to suit their own convenience. Transport is often less of a problem and services can also be provided to remote areas through outreach and mobile clinics. However, even where services are available, women may not always use them. Studies in countries as different as Ethiopia and the United States have found that women with unwanted pregnancies are less likely to seek prenatal care and that the outcome of such pregnancies is almost invariably worse than for wanted pregnancies (Kwast and others, 1985; Kiely and Kogan, 1994). Women may be discouraged by the attitudes of providers, particularly if there are important differences in social and economic status between clients and providers. Moreover, even when women know that prenatal care is important and want to receive it, they may be overwhelmed by other stressful events in their lives so that seeking prenatal care takes a lower priority.

The majority of women need only basic care during labour and delivery. Cleanliness and the presence of skilled personnel will help to ensure that normal births are clean and safe and that obstetric complications are dealt with promptly. Doctors, midwives and nurses who attend deliveries must have the midwifery skills needed to recognize the onset of complications, perform essential interventions, start treatment and supervise the referral of mother and baby for the management of interventions that are beyond the caregiver's competence or not possible in a particular facility.

The person best able to assist normal deliveries and manage or refer complications is the person with midwifery skills who is part of and lives in the community she or he serves. In many developing countries, there is a shortage of such well-trained health-care personnel and pregnancy-related care is often provided by less-qualified staff such as auxiliary nurses/midwives, village midwives, health visitors and trained traditional birth attendants (TBAs). These persons have at least some training and frequently provide the backbone of maternity services at the periphery. The outcome of pregnancy and labour can be improved by making use of their services, especially if they are supervised by well-trained midwives. However, to fulfil the complete set of tasks required to manage normal pregnancies and births and identify and manage or refer complications, the education, training and skills of TBASs are insufficient. Their background may also mean that their practice is conditioned by strong cultural and traditional norms which may impede the effectiveness of their training. In many developing countries, large numbers of deliveries take place outside the formal health-care system altogether and women give birth alone or with the help of a relative or an untrained TBA.

In developed countries and in many urban areas in the developing world, skilled care at delivery is usually provided in a health facility. In most developing countries, particularly in rural areas, many women prefer to deliver at home or in the home of parents or parents-in-law or in a setting provided by the TBA. WHO does not recommend any particular setting for birth; birth can take place in a range of appropriate places, from home to a tertiary referral centre, depending on availability and need. Home delivery may be appropriate for normal deliveries, provided the person attending the delivery is suitably trained and equipped and referral to a higher level of care is an option (World Health Organization, 1996).

Ensuring access to care during childbirth is very different from ensuring access to prenatal care. Although women and their health-care providers may know the expected date of delivery, in practice labour often starts earlier or later than expected. This can create problems because transport may not be available, the woman may not have made arrangements for the care of her other children and household responsibilities, and mobile outreach services cannot be organized to coincide with variable delivery dates. A recent study in Malawi found that although 90 per cent of women wanted to deliver in a health-care facility, only 25 per cent of them actually did so. The single most important reason given by 53 per cent of the women was that by the time they realized they were in labour, it was no longer possible that they could reach the health centre. Women who lived closer to the facility were, not surprisingly, most likely to be able to arrive there in time (Lule and Ssembatya, 1996).

TABLE 25. ESTIMATED AVERAGE INTERVAL FROM ONSET TO DEATH, FOR MAJOR OBSTETRIC COMPLICATIONS

Complication	*Hours*	*Days*
Haemorrhage		
Post-partum	2	
Antepartum	12	
Ruptured uterus		1
Eclampsia		2
Obstructed labour		3
Sepsis		6

Source: Deborah Maine, "Safe motherhood programs: options and issues", Center for Population and Family Health (New York, Columbia University, Faculty of Medicine, 1992).

Less attention has been paid to the role and content of post-partum care than to other aspects of maternity care. Yet a large proportion of maternal morbidity and mortality occurs during the post-partum period. Early post-partum care is essential in order to diagnose and treat complications, such as puerperal infections, secondary post-partum haemorrhage and eclampsia, which are major causes of post-partum mortality. Post-partum care provides an opportunity to check on the general well-being of mother and infant, and to ensure that the infant is feeding well. This is also a time to discuss birth-spacing and different methods of contraception.

Access to post-partum care may well be difficult because women may find it much harder to move about freely after childbirth. In many settings, women are confined to the home environment for specified time periods, or they may simply be too tired or overwhelmed with the demands of another baby to take the time to visit a far-off facility. During the post-partum period, greater efforts may be needed to bringing care to women rather than arranging to bring women to a health facility. Mobile outreach clinics, particularly those also providing infant care and immunization, may be a cost-effective solution.

Complications can arise at any time during pregnancy, childbirth or the post-partum period and when they arise, the problem of access to care becomes of critical importance. Since many complications arise suddenly and are catastrophic in nature, as is the case for post-partum haemorrhage due to uterine atony, eclamptic convulsions or ruptured ectopic pregnancy, the need for medical help is likely to be urgent. In such cases, obtaining life-saving care within hours becomes a matter of life and death for mother, infant or both (table 25).

Many pregnancies end in spontaneous or induced abortion and women with abortion-related complications need access to emergency obstetric care. However, access to such care is often problematic even in settings where abortion is legal. Women are often reluctant to admit to an unwanted pregnancy or to an abortion, whether legal or otherwise. Attitudes of providers who are often influenced by their own ambivalent feelings about abortion, are frequently cited as an important barrier to care. Young women in particular may be insufficiently aware of the signs and symptoms of complications and may not know where to seek care. Services may be too few to meet the need adequately.

G. PATTERNS OF UTILIZATION OF MATERNAL HEALTH CARE SERVICES

The range of health-care needs that can arise during pregnancy and the puerperium make the challenge of ensuring access to all women a complex one. In order to study patterns of maternal care utilization, WHO has been collecting data on the use of maternal health care services since 1985 and has built up a vast database on coverage of maternal health care and the barriers to appropriate utilization of services. The available data are derived from a wide variety of sources - routine health service reports, special surveys and government estimates. The data currently available show vast discrepancies in coverage of care between the developing and the developed world, between rural and urban areas and between different socio-economic groups. The current global estimates show that in the developing world approximately 65 per cent of pregnant women receive at least some care during pregnancy; 40 per cent of deliveries take place in a health facility and slightly more than half of all deliveries are assisted by skilled personnel. This contrasts sharply with the situation in developed countries where practically every woman receives regular care during pregnancy, delivery and the post-partum period (see table 26).

The regional estimates show that countries in Latin America and the Caribbean have the highest coverage of maternity care coverage in the developing world. Almost 75 per cent of women receive prenatal care, and give birth in a hospital or other health facility, and 75 per cent have a skilled person attending at delivery. Within the region, the coverage figures are lowest for Central America. In Asia, average coverage rates for prenatal care, deliveries in health facilities and deliveries attended by skilled personnel are

estimated at 65 per cent, 37 per cent and 53 per cent respectively. Extreme subregional variations exist. In Eastern Asia, for example, some 80 per cent of women receive prenatal care, and nearly 90 per cent have a skilled attendant at delivery while little more than half of all deliveries take place in health facilities. This contrasts sharply with South-central Asia where 52 per cent receive prenatal care, but only 1 woman in 3 has a skilled health attendant at delivery and only1 in 4 deliveries take place in a health facility. In Western Asia, almost 70 per cent of deliveries take place with skilled health personnel, but prenatal care coverage is lower, at 61 per cent. In South-eastern Asia, there is generally high prenatal care coverage (79 per cent) yet a relatively low rate of deliveries with skilled personnel (53 per cent) and of deliveries in health facilities (33 per cent).

Similarly, there are sharp contrasts in Africa, the region with the lowest coverage for the three indicators: 63 per cent prenatal care, 36 per cent deliveries in health facilities and just over 40 per cent with skilled attendant at delivery. At the high end, in Southern Africa, close to 90 per cent of women receive prenatal care and almost 80 per cent have skilled personnel at delivery. In Northern Africa, on the other hand, prenatal care coverage is below 60 per cent, while just over 60 per cent of deliveries take place with the assistance of skilled personnel, and two fifths in health facilities. The coverage of prenatal care in Northern Africa is comparable with that of Middle, Eastern and Western Africa where, however, generally fewer than 40 per cent of deliveries take place with a skilled care provider present and/or in a health facility.

TABLE 26. GLOBAL AND REGIONAL ESTIMATES OF PRENATAL CARE, DELIVERIES IN HEALTH FACILITIES AND DELIVERIES ATTENDED BY SKILLED PERSONNEL (AROUND 1996)

	Estimated percentage of women:		
	Receiving prenatal care	*Delivering in a health facility*	*Having a Skilled attendant at delivery*
World total	68	46	57
More developed regions[a]	97	98	99
Less developed regions	65	40	53
Africa	63	36	42
Eastern Africa	66	32	34
Middle Africa	58	41	42
Northern Africa	56	39	63
Southern Africa	89	76	79
Western Africa	60	32	34
Asia[a]	65	37	53
Eastern Asia[a]	80	54	86
South-central Asia	52	26	34
South-eastern Asia	79	33	53
Western Asia	61	57	68
Europe	97	97	98
Latin America and the Caribbean	73	71	75
Caribbean	88	70	71
Central America	70	58	65
South America	73	78	80
Northern America	95	99	99
Oceania[a]	75	49	52

Source: World Health Organization, Geneva.

[a]Japan, Australia and New Zealand being excluded from the regional estimates, but included in the total for the more developed regions.

Post-partum care has been a relatively neglected dimension of maternity care. Less than one third of developing countries report national data, and levels of coverage are as low as 5 per cent. The lack of reporting on post-partum care is an indication of its low priority and it does not feature in the goals of major international conferences. Estimates based on the limited data available indicate coverage of post-partum care below 30 per cent for developing countries and a global estimate of 35 per cent (World Health Organization, 1997a). This low level of care is disturbing, since timely interventions during the post-partum period can prevent deaths of both mothers and newborn infants, and can reduce the incidence of long-term pregnancy-related morbidities.

These indicators on maternal health care utilization have a number of limitations. International comparability is limited unless the same definitions have been used in data collection and precision is highly dependent on the quality of data collection. Furthermore, the indicators listed here do not reflect the content and/or of the quality of care provided. While these particular indicators have been defined for global use, country-specific adaptations are common and, indeed, appropriate. For example, reports of maternity care coverage rarely specify the level and quality of the training the care provider received. Similar levels may therefore hide important discrepancies in actual care provided.

H. Barriers to use of healt-care services

The patterns of health service utilization that can be observed from the indicators collected at the global level reflect only the end point in a complex series of issues related to availability, accessibility, affordability and acceptability of care. Although access is often understood in a narrow way in terms of physical proximity to services, in fact it is a multidimensional concept dependent on a number of determinants. Broadly speaking, use of services depends on:

(*a*) Extent to which women and their families perceive the need for care;

(*b*) Knowledge that people have about when and where to seek care;

(*c*) Extent to which people are able to overcome the many barriers — physical, economic, social, cultural — that stand between them and the use of services.

1. *Perception of the need for care*

In most parts of the world, pregnancy is a common event, and is not perceived as a condition requiring anything special in the way of health care (Pino and others, 1991); but the perception of the normalcy of pregnancy can impede recognition of the risks associated with pregnancy and childbirth (Dujardin and others, 1995). A number of studies have found that women and their families did not recognize complications or interpreted them as being less serious than was the case. Heavy blood loss following delivery is viewed in many societies as a form of purification (Lefeber-Mans, 1994).

In the early years of the Safe Motherhood Initiative, it was assumed that providing women with information about the risks of pregnancy and childbirth, and about when and where to seek help, would result in increased use of the health-care system. This was one of the thrusts behind campaigns such as "Facts for Life" (United Nations Children's Fund/World Health Organization/United Nations Educational, Scientific and Cultural Organization, 1993). It has become clear that perceptions about pregnancy, illness and health are only one factor in the complex constellation of determinants of health service use. Knowledge of signs and symptoms of complications needs to be supplemented by information about where to go for help. All too often, families spend considerable time and resources being moved from one health-care provider to another in both the informal and the formal systems, finally reach life-saving care only after long delays during which time the woman's condition has worsened, perhaps irreversibly. As a direct result of their experiences with lower levels of the health-care system, many women prefer to go straight to the local hospital if at all possible on the grounds that the "real" doctors are to be found there and not in rural areas (Villaromin-Bautista and others, 1990).

In many parts of the world, women's decision-making powers, particularly in relation to matters of sexuality and reproduction, are extremely limited (Government of Senegal and United Nations Development Programme, 1987). It is not only women themselves who need information on when and where to seek care, since very often the decision is not theirs to take but is the responsibility of the husband or some other family member such as the mother-in-law. A research project in Nepal tried to address this issue by providing information to mothers-in-law to improve both traditional care and health care seeking practices (Dal and others, 1991); but even in this case, the final decision as to whether or not a woman would be able to go to the formal health sector belonged to the husband, who had not been involved in the information sessions.

Widespread community information and mobilization are needed to ensure that women and their families are aware of the need for special care during pregnancy and childbirth and that they know about and recognize obstetric complications as well as know where to obtain help if it is needed. In Egypt, a public-health information campaign on widely accessible and widely watched television channels brought home the importance of timely health-care seeking, emphasizing the responsibilities of husbands and other family members in ensuring access to care. In Bolivia, community mobilization techniques were used to increase awareness about pregnancy-related complications. Such community health promotion must not only inform the public about the risks and where to seek care but also seek to examine traditional beliefs about the causes of pregnancy-related complications which are often ascribed to women's behaviour, to fate, to malign influences or other factors beyond the reach of the health-care system. Yet such beliefs can also be used to stimulate greater awareness of the need for care; in most societies, a great premium is placed on the achievement of successful fertility and families will go to great lengths to ensure that a woman receives care if they are aware of its benefits. Such

community mobilization must aim to ensure that appropriate health care seeking behaviour becomes part of local social norms. A word of caution is in order, however, about such broad-based information, education and communication strategies. Before informing people about when and where to seek maternal health care, it is essential to ensure that quality care is indeed available and accessible.

2. *Distance*

The most obvious impediment to use of maternal health care services is distance. In rural settings, where women have little access to resources to pay for transport and where roads are likely to be poor and vehicles rare, such physical barriers render even the use of routine prenatal care services complicated and use of services for complications and emergencies difficult. Recent Demographic and Health Surveys have attempted to estimate distances between women and the nearest health facility or hospital. In most rural settings, at least 1 woman in 3 lives more than five kilometres (km) from the nearest facility and at least 80 per cent live more than five km from the nearest hospital (see table 27).

The problem of distance appears, in some settings, to be the major constraint in use of health services for delivery. A recent study in the rural United Republic of Tanzania found that 84 per cent of the women who had had their babies at home intended to deliver in a health facility but encountered problems related to distance and lack of transport (see table 28).

The problem of distance from a health-care facility is not one that can be easily solved; the barriers differ significantly between settings and the solutions must vary accordingly. In some countries, maternity waiting homes have been established to bridge the gap between women and the health system. Here women considered to be particularly in need of medical care or at risk of so being can await their delivery. Maternity waiting homes are not themselves health-care facilities but they are close enough to a formal health-care setting to render such care accessible if and when needed. Elsewhere, emergency transport and referral mechanisms have been set up. Another option for bringing women closer to care is to decentralize medical care by delegating authority to the lowest level of the health-care system able to provide it adequately. A combination of all three approaches will likely be needed if the barrier of distance is to be overcome.

3. *Cost*

The cost of health care is likely to weigh heavily on a woman's decision to use available services. Evidence from about the world has shown that user fees or other charges for services tend to have a negative impact on utilization. It is likely that user fees deter women from booking hospital deliveries even though they are considered to be at high risk of developing complications. As a result, falling overall numbers of hospital deliveries can be accompanied by increasing numbers of emergency admissions (see table 29).

In general, the poorer women are the more likely are charges to affect their likelihood of using services. Work in Cote d'Ivoire (Gertler and van der Gaag, 1988) and Peru (Gertler and others, 1988) has shown that user fees deter everyone from using services but they deter the poor most of all.

A range of options have been tried to overcome the economic barrier to health care; essentially all seek to reduce the direct costs to the woman and her family. Insurance schemes that spread the costs among a community are an increasingly favoured option (Ron, 1993). Insurance schemes work well when everyone is obliged to join. Where this is not the case, a process of "adverse selection" devel-

TABLE 27. AVERAGE ESTIMATED DISTANCE FROM HEALTH SERVICES IN RURAL AREAS, 1990-1996

Country	*Percentage of women who live more than 5 km from the nearest health facility*	*Percentage of women who live more than 5 km from the nearest hospital*
Egypt	4	81
Tunisia	35	95
Togo	39	95
Uganda	65	95
Zimbabwe	51	94
Colombia	39	88
Dominican Republic	45	95
Ecuador	36	88
Guatemala	41	97
Thailand	34	80

Source: Demographic and Health Surveys, various years.

ops which results in the premiums becoming too expensive for the poorest segments of the population. In any case, poverty generally deters people from participating in insurance schemes (Carrin and Politi, 1997).

Some Governments have made binding commitments to ensure free care at the service delivery point in order to reduce economic barriers. In these cases, Governments explicitly acknowledge that maternal health care is not simply a private matter — one of interest to the woman alone — but a public health issue of importance, with benefits for families, communities and societies as a whole. Where a completely free service is not possible within existing national budgets, other options have been developed, including providing services at a flat fee to cover both routine prenatal and delivery care and also care for the management of complications should they arise. Governments can also consider the adoption of differential health insurance premiums in order to ensure access for the poor.

4. *Opportunity costs*

In addition to the direct cash costs incurred in obtaining health care, there are other costs, notably the opportunity costs of forgoing some other activity in order to attend a health-care facility. Most women have only limited time available for their own health care which must be balanced against the time needed to care for children, fetch water, cook, clean, grow and prepare food, and trade or engage in other employment. Finding time to attend a prenatal care session is unlikely to rank high in the order of priorities, particularly for women who view pregnancy and childbirth as a normal life event, not requiring special care or attention. The opportunity costs incurred for a hospital delivery or a period in a maternity waiting homes are likely to be even greater. For many women, a maternity waiting home is not an option because of family responsibilities. Overcoming barriers such as these requires the close involvement of families and communities in caring for pregnant women. It may also necessitate changes in the way maternal health care services are organized. For example, a study in the United States found that women were deterred from seeking prenatal care because the major provider did not allow children in the clinic waiting room since it was overcrowded (Bedics, 1994).

5. *Social barriers*

For many women, accessing the formal health-care sector is impossible or extremely difficult because local social norms restrict women's mobility. Cultural factors often play a dominant role in choice of place of delivery and in health care seeking. Women may be unwilling to be examined by men (Kempe and Stougard, 1984) or reluctant to talk openly about problems related to the reproductive tract and genital area. In some settings, women are forbidden to receive care from male health workers (Feldmeier and others, 1993). In Benin, the authorities exerted considerable pressure on women in their effort to persuade them to have institutional deliveries; this pressure included levying administrative sanctions such as fines and erecting barriers to obtaining birth certificates for non-institutional deliveries. Yet women continued to insist on a home delivery which provided them with an opportunity to demonstrate courage and bring honour to the family by their stoical demeanour during labour and childbirth (Sargent, 1985).

TABLE 28. REASONS FOR NON-USE OF HEALTH SERVICES, FOR SUMVE, UNITED REPUBLIC OF TANZANIA, 1990-1995

Reason for not delivering in a health facility[a]	*Percentage*
Intended to deliver in a health facility	84
Too far away	61
No transport	45
Not necessary	12
No child-care	1
Husband/family forbid	1
Poor services	1
Too expensive	3
Delivered on way to facility	4
Friends/relatives could assist	3
Other	10
Missing information	2

Source: G. Bicego and others, *Sumve Survey on Adult and Childhood Mortality: Tanzania 1995*, (Calverton, Maryland, Macro International Inc., 1995).

[a]Multiple responses possible.

TABLE 29. IMPACT OF USER FEES ON OBSTETRIC ADMISSIONS, ZARIA, NIGERIA, 1983-1988

	1983: Obstetric services free	*1985: Fees for some services introduced*	*1988: Increases in fees for services*
Obstetric admissions	7 450	5 437	3 376
Deliveries	6 535	4 377	2 991
Complicated cases	0	26	104
Maternal deaths	2	1	62

Source: K. Harrison, "Maternal mortality in Nigeria: the real issues", *African Journal of Reproductive Health*, vol. 11, No. 7 (1997), p. 13.

6. *Provider barriers*

In recent years attention has turned increasingly to the interactions between clients and providers and to the way these may affect utilization of maternal health care services. Study after study has found that women often describe the providers in the formal health-care system as unkind, rude and unsympathetic. Not surprisingly, where such attitudes prevail, use of the formal health-care system is infrequent and tends to occur only as a last resort when recourse to the informal sector has failed to achieve the desired results. In the United Republic of Tanzania study already cited, 21 per cent of the women gave as their reason for delivering at home, despite the acknowledgment that facility delivery was probably safer, the fact that health centre staff were unkind. A study in the Niger identified a range of sources of conflict between midwives and women related to pregnancy care (Jaffre and Prual, 1994). For providers, safe pregnancy and childbirth are describable in biomedical terms; for women, safety is a matter of psychological and spiritual integrity.

Technical training alone is not sufficient to ensure access of all women to quality maternal health care. In addition, the cultural beliefs and practices of clients need to be taken into account. A recent pre-Congress workshop of the International Confederation of Midwives, in collaboration with the United Nations Children's Fund (UNICEF) and WHO recently urged that "Midwifery education programmes . . . be reviewed to improve midwifery practice by giving priority to providing a community-based education which is founded on the identified needs and perceptions of the community and the community's perception of the midwife". Dialogue is needed between women and providers at all levels thus offering an opportunity to ensure that the services on offer respond to women's needs and are thus accessible to them.

I. MONITORING AND EVALUATION

The Programme of Action calls for the development and implementation of "adequate evaluation and monitoring mechanisms to assess the progress being made in reducing maternal mortality and morbidity and to enhance the effectiveness of ongoing programmes" (United Nations, 1995, chap. I, resolution 1, annex, para. 8.22).

As experience with implementing safe motherhood programmes has grown, it has become increasingly clear that the traditionally used indicator of maternal health status — the maternal mortality ratio — is not useful for monitoring progress in the short term. Maternal mortality ratios are inappropriate for monitoring for several reasons:

(*a*) Few developing countries have the sophisticated and comprehensive systems of vital registration needed to accurately monitor levels of maternal mortality;

(*b*) Maternal deaths are relatively rare events even where maternal mortality is high; thus all household survey techniques are subject to wide margins of error and very expensive to implement;

(*c*) The simple measurement tools developed in recent years such as the sisterhood method are not appropriate for regular monitoring purposes because they provide data relating to a point situated some time in the past.

For these and other technical reasons, most safe motherhood programmes now rely on process indicators for regular programme monitoring. Such process indicators can include the number and distribution of essential obstetric care services, the proportion of deliveries attended by skilled health-care providers or in institutional settings, the rates of operative delivery and institutional case-fatality rates. WHO and UNICEF have developed guidelines to assist countries in gathering, analysing and interpreting such indicators (United Nations Children's Fund/World Health Organization, 1997). In addition, countries are urged to make maximum use of qualitative techniques to evaluate the quality of care provided such as in-depth maternal audits and case reviews (World Health Organization, 1995). Following the International Conference on Population and Development, and in the context of the follow-up to international conferences through the Administrative Committee on Coordination (ACC) Task Force on Basic Social Services for All

(BSSA), a broad measure of agreement has been achieved between the agencies of the United Nations system on the methodological aspects of monitoring maternal mortality and on a limited set of process indicators to assist countries in their efforts to assess progress towards the agreed goals of the Programme of Action (World Health Organization, 1997b; 1997c).

Notes

[1]Unsafe abortion is defined as a procedure for terminating an unwanted pregnancy that is performed by persons lacking the necessary skills and/or in an environment lacking the minimal medical standards (based on World Health Organization, "The prevention and management of unsafe abortion", Report of a Technical Working Group, Geneva, April 1992 (WHO/MSM/92.5)).

[2]Statement from a Task Force Meeting on Validation of Women's Reporting of Obstetric Complications in National Surveys, *MotherCare Matters* (Arlington, Virginia, vol. 6, No. 2 (March/April 1997), pp. 15-16.

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V. HUMAN IMMUNODEFICIENCY VIRUS (HIV) INFECTION AND ACQUIRED IMMUNODEFICIENCY SYNDROME (AIDS)*

Widespread transmission of the human immunodeficiency virus (HIV), which causes acquired immunodeficiency syndrome (AIDS), began in the late 1970s in sub-Saharan Africa, Northern America and the Caribbean. By 1990, epidemics were being recorded in nearly all countries of the world.

In 1997, areas that were barely touched six years ago by HIV, are seeing emerging and in some cases rapidly spreading epidemics — in places as far afield as Cambodia and Namibia. Indeed, in Africa, where so much of the devastation wrought by AIDS in the past 16 years has taken place, while HIV prevalence rates are falling in some of the countries with the longest established epidemics, such as Uganda, new epidemics in the southern part of the continent are just beginning to spread through rural and urban areas alike.

A. EPIDEMIOLOGY, DETERMINANTS AND PUBLIC HEALTH

1. *Modes of transmission*

HIV is transmitted exclusively through body fluids. Three principal means of transmission have been identified by laboratory and epidemiological studies.

Sexual transmission is estimated to account for over 85 per cent of all HIV infections worldwide. This includes heterosexual intercourse and intercourse between males. The vagina and the anus are the two principal sexual routes through which the virus can be transmitted. Oral sex is also a possible means of transmission, though the risk here is generally considered low (Samuel and others, 1993).

The majority of infections occur through heterosexual sex, although at least 510 per cent are due to sexual transmission between men. These estimates vary considerably between countries. In Northern America, Australia, New Zealand and most of Western Europe, the proportion of HIV infections due to sex between males is closer to 70 per cent.

Transmission through blood and blood products is the second principal means of passing on HIV infection. Injecting drug use, where injectors share unsterilized needles or syringes, is a significant route in this connection in many places, both in developed and in developing countries. This category includes infections resulting from the transfusion of infected blood and nosocomial transmission. Nosocomial transmission refers to transmission in a health-care setting, and covers injections for medical purposes and invasive surgery, as well as accidental "needle-stick" injections suffered by medical staff or patients. Also included are infections arising from the use of infected blood products, such as blood coagulants.

The third principal means of transmission is from mother to child, whether perinatally and post-partum (see subsect. 3 below on "Mother-to-child transmission").

2. *Types and sub-types of HIV*

There are two known types of HIV — HIV-1 and HIV-2. HIV-1 is present in all parts of the world, while HIV-2 has been found mainly in Western Africa and occasionally elsewhere. HIV-1 itself contains a number of sub-types, labelled A, B, C, . . ., I, plus type O. Sub-type B, for instance, is the main sub-type found in Northern America, Europe and Australia, while sub-types A and C (and to a lesser extent D) predominate in sub-Saharan Africa. In Thailand, sub-type E is the most common, having arisen through heterosexual transmission; sub-type B also exists, having originally spread through injecting drug use.

HIV-1, the far more prevalent type, is more aggressive than HIV-2, both in its transmissibility and in its pathogenicity. It is possible, though this is not known for sure, that there may also be differences between sub-types of HIV-1 as regards transmissibility and pathogenicity.

3. *Mother-to-child transmission*

Mother-to-child transmission (also referred to as vertical transmission) is the overwhelmingly predominant source of HIV infection in children under age 15. Of the 3 million infants born with HIV infection since the beginning of the pandemic, about 90 per cent have been born in Africa. The number of cases in India and South-East Asia, however, appears to be rising rapidly. In 1996, an estimated 350,000 infants worldwide were born infected with the virus. By the year 2010, AIDS may more than double the mortality rates of children under five years of age in the regions of the world most affected by HIV.

Studies generally suggest that in developed countries the probability is between 15 and 25 per cent that an HIV-positive woman's baby will have the virus, and in developing countries the corresponding probability is in the range of 25-45 per cent. Worldwide, the average probability is about one third. The differences in probability between developing and developed countries may be explained by factors surrounding the delivery, by maternal characteristics or by differing frequencies of breastfeeding. In most cases not accounted for by breastfeeding, transmission is believed to occur through the placenta at the very late stages of pregnancy, in labour or during delivery. Among populations where breastfeeding is common, it may account for up to one third of all cases of mother-to-child transmission.

*Prepared by the Joint and Co-sponsored United Nations Programme on HIV/AIDS (UNAIDS), Geneva.

Children can also be infected with HIV through blood transfusions and through the use of contaminated medical instruments. In Europe, over one half of cases of children being infected with HIV since the beginning of the pandemic have occurred in Romania, those children having been infected, mainly in the late 1980s, through contaminated blood products and syringes.

4. *Determinants of the HIV epidemic*

Three broad approaches have been used to explain the dynamics of the epidemic: the epidemiological, the cultural and the socio-economic (Caraël, Buvé and Awusabo-Asare, 1997). The epidemiological approach tends to concentrate on the immediate characteristics and behaviour that determine directly whether an individual will become infected with HIV. A number of risk factors are studied including biological, genetic and behavioural ones. The cultural approach considers the cultural factors that influence sexual and drug injecting norms and behaviour. A third approach is to examine the socio-economic conditions that shape behaviour and risk situations. All these approaches are affected by the different gender roles in a particular society. Gender roles and relations have a significant influence on the course and impact of the HIV/AIDS epidemic. They vary over time, according to culture and community, and can have behavioural, social and economic implications.

The epidemiological approach

Sexual behaviour and drug injecting behaviour at the individual level constitute one set of concerns in the epidemiological approach. Early on in the epidemic, high rates of partner change and commercial sex were identified as individual risk factors for HIV infection. More recently, it has been proposed that for the same rate of partner change, concurrent partnerships are more efficient than serial relationships as regards propagating the virus (Caraël and others, 1995; Hudson, 1993).

There is also a strong determining relationship between sexually transmitted diseases (STDs) and the sexual transmission of HIV. The presence of both ulcerative STDs (such as syphilis, chancroid and herpes) and non-ulcerative STDs (such as gonorrhoea and chlamydia) in either partner can increase the risk of transmission of HIV up to 6- to 10-fold. All lesions in the genital areas — whether from infectious causes or traumata — can greatly increase transmissibility.

STDs often exist without symptoms. In women, only 30 per cent of cases are symptomatic, while the corresponding figure for men is about 90 per cent. Around 333 million new cases of curable STDs were estimated by WHO to have occurred worldwide in 1995 in women and men aged 15-49. In women of childbearing age, disease and death due to STDs — even excluding HIV — are second only to maternal causes. Prevention of STDs — as well as their detection and treatment — is thus an important HIV prevention strategy, as well as a public-health priority in its own right. In terms of HIV prevention, priority should be given to STD prevention and treatment for people with high-risk sexual behaviour, who in general also have the highest STD infection rates (see box 6).

A possible biological co-factor in the transmission of HIV— one still much debated — is male circumcision. Some studies and reviews have reported an association between lack of male circumcision and HIV prevalence (Caldwell and Caldwell, 1993; Mertens and Caraël, 1995; de Vincenzi and Mertens, 1994). This association may represent a causal effect, or else may be due to intermediate variables such as sexual behaviour, genital cleanliness and/or prevalence of other STDs (chancroid particularly has been suggested in this connection).

An infected person carries a certain volume of HIV inside his or her system, known as the viral load. This viral load can increase and decrease considerably during the course of HIV infection. People with higher viral loads are more infectious than those with lower viral loads (and the virus is thus more transmissible). Infected individuals are known to have high viral loads shortly before the onset of AIDS or when their CD4 *T*-cell count falls to a critically low level. It is also thought that they have high viral loads immediately after infection, for the first two to six months. Genetic factors may also influence an individual's susceptibility to HIV.[1]

The cultural approach

The culturalist model argues that traditions of family formation, lifestyles, and the expectations that people have of one another in a particular society are the main factors determining sexual behaviour. In this view, factors such as polygyny, post-partum sexual abstinence and quick remarriage tend to lead to high rates of partner change. Similarly, a society's emphasis on high fertility mitigates against widespread use of condoms.

The socio-economic approach

In many developing countries, poverty and unemployment or underemployment lead to migration to cities and destroy traditional households. People with limited access to resources may be more likely to delay marriage. In some cases, poverty and a lack of viable alternatives are thought to push women into sex work. HIV infection levels have been linked to wealth threshholds, gender inequalities and other indicators of socio-economic development (Borgerhoff-Mulder, 1995).

Many people who move frequently — including truck drivers and other transportation workers, seasonal agricultural workers and other temporary migrants — have a high risk of HIV infection. Long-distance truck drivers are of special concern because they are often at high risk and can spread STDs and HIV over long distances. A study among West Bengal long-distance truck drivers reported that 60 per cent had visited sex workers, 36 per cent had not heard of AIDS and only 22 per cent had used condoms regularly.

Studies in southern Africa have shown that patterns of marriage and sexual relations have been fundamentally affected by generations of economic migration, which has become the norm for up to 60 per cent of the adult male population in countries such as Botswana and Lesotho (Macdonald, 1996; Filmer, 1996).

BOX 6. TREATING SEXUALLY TRANSMITTED DISEASES REDUCES HIV INCIDENCE: RESULTS OF THE MWANZA, UNITED REPUBLIC OF TANZANIA, TRIAL

A key advance in HIV/AIDS research in recent years has been the confirmation that treating sexually transmitted diseases (STDs) reduces the incidence of HIV. This evidence comes from the Mwanza trial, the first randomized trial to demonstrate the impact of preventive measures against HIV in a general population setting.

The aim of the Mwanza trial was to implement improved STD treatment services for the rural population of this northern Tanzanian region. These services were fully integrated into the primary health care system based on the syndromic treatment method (one not requiring laboratory diagnosis) recommended by WHO. The services were designed to be affordable and replicable on a large scale in resource-poor settings, and their impact was measured in a randomized trial: six communities with the improved STD services (the intervention group) were compared with six matched comparison communities with pre-existing STD services (the comparison group).

A random sample of 12,000 adults in Mwanza was followed over two years, recording HIV incidence and the prevalence of selected STDs. HIV prevalence at baseline was about 4 per cent in both the intervention and comparison groups. Incidence of HIV infections over two years was 1.2 per cent in the intervention communities, compared with 1.9 per cent in the comparison communities, showing a reduction of about 40 per cent from the intervention. Reductions were seen in all age and sex groups.

A detailed economic evaluation showed that the annual cost of the Mwanza intervention programme for a population of 150,000 was about US$ 68,000, or about 45 cents per capita. The cost per case of HIV infection averted was about US$ 250, or US$ 11 for each year of healthy life saved. This compares favourably with child immunization programmes and other highly cost-effective interventions.

The data from Mwanza show that improved STD treatment services are both effective and cost-effective and should therefore be promoted as an essential component of HIV/AIDS control activities wherever STDs are highly prevalent. Large-scale implementation of STD treatment services could have a major impact on the HIV pandemic worldwide.

5. *Progression of HIV infection*

The time between one's becoming infected with HIV and the onset of clinical symptoms (usually the event or events that signal the development of AIDS) varies widely from person to person. On average, HIV-infected persons become ill with AIDS within 10 years of infection. At present, it is not known what proportion of HIV-infected persons will survive for many years after infection, for example, more than 20 years, but it is likely that this proportion will be small.

For a person who develops AIDS, the average survival time in developed countries has improved — from a period of about 1 year in 1987 to around 2.5 years in 1994. Since 1994, triple antiretroviral therapy has been introduced in developed countries and recent evidence suggests that patients now survive longer. While the average survival gain for those on triple therapy is unknown at present, one estimate suggests that as much as three extra years of survival time might be gained if antiretroviral therapy is started when the patient is still asymptomatic (Moore and Bartlett, 1996).

The outlook for an HIV-infected person with AIDS in developing countries, on the other hand, is much worse: a hospital-based study in Thailand has suggested an average survival time from the onset of AIDS of seven months, and a study in Brazil reported survival after AIDS to average five months (Kitayaporn and others, 1997; Chequer and others, 1992).

With regard to paediatric HIV infection, the AIDS pandemic in developing countries has seen a reversal of many of the gains achieved by WHO/UNICEF's child survival programmes. It is estimated that 40 per cent of infected children die before age 1, 50 per cent before age 2, and 80 per cent by age 5. In many of these children, death occurs before the development of full symptoms of AIDS.

6. *Tuberculosis and AIDS*

High rates of HIV infection (20-67 per cent) in patients with pulmonary and extrapulmonary tuberculosis (TB) have been reported not just in Africa, but in many other parts of the world as well. TB is the single most important cause of death in HIV-infected people in the world. Unlike other opportunistic (AIDS-related) infections, TB also poses an immediate health hazard for people uninfected by HIV.

There have been some encouraging recent developments, however. First, in the past five years, the DOTS strategy (directly observed treatment, short course) of treating TB, promoted by WHO, has gained widespread acceptance in developing and developed countries alike. As the cost of anti-TB drugs has decreased at the same time, treatment — and therefore cure — of TB has become more affordable.

Second, several clinical trials — in Haiti, Kenya, Uganda and Zambia — have shown the efficacy of isoniazid prophylaxis (300 milligrams (mg) per day orally) for TB among HIV-positive people at high risk of TB (Hawken and others, 1997; Jintana and others, 1997; Gordin and others, 1997). A study in Zambia (Foster, Godfrey-Faussett and Porter, 1997) demonstrated that such an intervention has approximately the same cost-effectiveness as treating active TB, and in feasibility studies in Thailand, Uganda and Zambia it was demonstrated that, if the logistics of identifying eligible patients can be streamlined, the intervention is feasible. The prevention of TB among HIV-infected persons at high risk of developing TB — and most of those living in developing countries are at high risk — should, along with improved diagnosis and treatment of TB, therefore become a priority in the management of HIV-infected persons (O'Brien and Perriëns, 1995).

7. *Opportunistic infections*

Apart from TB, a range of other infections and malignancies commonly affect those with advanced HIV infection (the stage of the infection usually called AIDS). Such infections and malignancies are called "opportunistic", since to take hold, they avail themselves of the weakened immune system. Most such opportunistic infections are extremely rare in people without HIV, and whose immune systems are not compromised. At the same time, some opportunistic infections are caused by bacteria or viruses that commonly exist in people without usually provoking symptoms. Cytomegalovirus (CMV), for instance, exists symptomatically in about 60 per cent of the population.

One of the most common opportunistic infections in Northern America, Europe and parts of Asia and Latin America — though not in Africa — is Pneumocystis carinii pneumonia (PCP), whose symptoms, along with fever and respiratory symptoms, are those of pneumonia. Prophylaxis for PCP is possible, generally affordable and strongly recommended for HIV-infected people living outside Africa. PCP is a protozoa infection, as is toxoplasmosis, another opportunistic infection common in parts of Africa, Latin America and Europe.

Common viral opportunistic infections include CMV and herpes. Among the fungal diseases are candidiasis, cryptococcal meningitis and penicilliosis. Candidiasis occurs in localized forms (affecting the mouth and throat, and the vagina) and systemically. The mouth-and-throat variant occurs at least once in the progression of the disease in all HIV-infected people.

The bacterial opportunistic diseases include TB, Mycobacterium avium disease, bacterial pneumonia and septicaemia. Opportunistic malignancies include Kaposi's sarcoma, lymphoma and squamous cell carcinoma.

B. Distribution of the HIV/AIDS epidemic

1. *The global situation*

Over 30 million people worldwide were estimated by the Joint and Co-sponsored United Nations Programme on HIV/AIDS (UNAIDS) at the end of 1997 to be living with HIV or AIDS, about 1.1 million of whom were children. More than 90 per cent of cases are to be found in developing countries.

An estimated 5.8 million new HIV infections occurred during 1997, at an average rate of about 16,000 per day. Of these new infections, about 40 per cent were in women, and about 10 per cent were in children. HIV affects young adults disproportionately: in 1997, over a half of newly infected adults were under age 25. HIV-related disease caused the death of some 2.3 million people in 1997 — about one fifth of all those who have died since the beginning of the pandemic (see table 30). Around 460,000 of these 2.3 million were children. Table 31 shows the geographical distribution of people currently living with HIV/AIDS.

2. *Regional situations*

HIV infection is not uniformly distributed geographically. Some areas have experienced widespread transmission since the early 1980s, while in others the virus began to spread only starting around 1991 (see figure 14). The global pandemic comprises a series of overlapping micro-epidemics, each with its own structure and dynamics. While a few relatively affluent countries have been able to arrest the growth of the epidemic within their boundaries, in other parts of the world new and sometimes explosive epidemics are taking off. Virtually every part of the world is now affected by HIV.

TABLE 30. ADULT AND CHILD DEATHS FROM HIV/AIDS DURING 1997

Region	*Number of deaths*
Sub-Saharan Africa	1 800 000
South and South-eastern Asia	250 000
East Asia and the Pacific	6 200
Caribbean	19 000
Latin America	81 000
Northern Africa and Western Asia	13 000
Northern America	29 000
Western Europe	15 000
Central and Eastern Europe/Central Asia	300
Australia and New Zealand	700
World Total	2.3 million

Source: World Health Organization/Joint and Co-sponsorred United Nations Programme on HIV/AIDS, *Report on the Global HIV/AIDS Epidemic* (Geneva, December 1997).

Sub-Saharan Africa

About 20 million people, about two thirds of the world's total, were estimated at the end of 1997 to be living with HIV in sub-Saharan Africa. Three broad geographical areas account for almost 90 per cent of current HIV infections in Africa, and within these areas each of 19 countries has at least 100,000 people living with HIV. In Central and Eastern Africa, about a third of the continent's HIV cases are found in the group comprising Democratic Republic of the Congo, Cameroon, Ethiopia, Kenya, Rwanda, the Sudan and Uganda. A similar proportion is contributed by a second group in Southern Africa: Botswana, Malawi, Mozambique, Namibia, South Africa, the United Republic of Tanzania, Zambia and Zimbabwe. The third group, consisting of the four Western African countries of Burkina Faso, Côte d'Ivoire, Ghana and Nigeria, contributes about 15 per cent to the total number of people living with AIDS in Africa.

In Kenya, Malawi, Rwanda, Uganda, the United Republic of Tanzania, Zambia and Zimbabwe — countries where HIV began to spread in the early 1980s — over 10 per cent of women attending antenatal clinics in urban areas have been found to be HIV-positive. In some surveillance sites, the rates exceed 40 per cent. The epidemics whose origin is most recent — those in Botswana, Lesotho, Namibia, South Africa and Swaziland — have followed patterns of spread and intensity similar to those in the longest established group. Botswana, Namibia and South Africa have all seen dramatically sharp increases in HIV rates in a very short period of time. Botswana, Namibia and Zimbabwe are the countries worst hit by the epidemic, with Botswana's estimated prevalence rate, for example, reaching as high as a quarter of the total adult population. In South Africa, between 1993 and 1995 prevalence in pregnant women rose from 4.3 to 11 per cent in the province of Free State, and from 9.6 to 18 per cent in KwaZulu-Natal. Figure 15 shows changing prevalences in pregnant women in a number of Southern African cities.

Other parts of sub-Saharan Africa are experiencing an intermediate stage in their epidemics, with typically between 1 and 10 per cent of women attending antenatal clinics proving infected. Some of these countries still have relatively low HIV prevalence rates, though in several — such as Nigeria and Cameroon, which had previously been spared relatively speaking — the rates have begun to rise.

Rates of infection among female sex workers in many parts of Africa are extremely high. In Nairobi, rates as high as 80 per cent are now found; and in Abidjan, Côte d'Ivoire, the figure is about 55 per cent.

The virus in Africa is primarily of the HIV-1 type. HIV-2 is found mainly in Western Africa — the highest prevalences being in Guinea-Bissau and southern Senegal — though infections have also been confirmed in other African countries, including Angola and Mozambique. While HIV-1 has spread rapidly in Western Africa, HIV-2 has remained relatively stable there — a phenomenon attributed to the higher transmissibility of HIV-1.

TABLE 31. ESTIMATED DISTRIBUTION OF PEOPLE LIVING WITH HIV/AIDS, 1997

Region	*Number of adults and children currently living with HIV/AID*	*HIV prevalence rate (percentage)*[a]
Sub-Saharan Africa	20 800 000	7.4
South and South-eastern Asia	6 000 000	0.6
East Asia and the Pacific	440 000	0.05
Caribbean	310 000	1.9
Latin America	1 300 000	0.5
Northern Africa and Western Asia	210 000	0.13
Northern America	860 000	0.6
Western Europe	530 000	0.3
Central and Eastern Europe/Central Asia	150 000	0.07
Australia and New Zealand	12 000	0.1
WORLD TOTAL	30.6 million	

Source: World Health Organization/Joint and United Nations Programme on HIV/AIDS, *Report on the Global HIV/AIDS Epidemic* (Geneva, December 1997).

[a]Proportion of adults living with HIV/AIDS in the adult population (15-49 years of age).

Asia

The significant spread of HIV in parts of Asia began later than in Africa — in the mid-1980s and thereafter. In 10 years or less, prevalence rates have risen very rapidly in some areas. In addition to large variations between countries, there are also considerable intracountry differences in the dynamics of HIV transmission in Asia, notably in China and India.

The best-documented country in the region is Thailand, where the epidemic took off in 1988 with an initial spread among injecting drug users (IDUs). Prevalence in that group rose from zero to 35 per cent in the first nine months of the year. Similar rises among IDUs in Myanmar, and then in northeast India, followed within two years. Sexual transmission, however, has been the predominant mode in Asian countries. In Thailand, infection among brothel-based sex workers rose from 3.5 per cent in 1989 to 33 per cent by the end of 1994. HIV prevalence in the general population — as reflected in the rate for pregnant women attending antenatal clinics (2.3 per cent in 1995) — has continued to increase. However, prevention efforts — including a national campaign for 100 per cent condom use in brothels — are beginning to take effect, and the infection rate among military conscripts, traditionally high, fell from 3.6 per cent in 1993 to 2.5 per cent in 1995. Some 6,400 children are estimated to be infected each year in Thailand, with this figure representing about 10 per cent of all new infections.

Cambodia and Myanmar are two other countries in South-Eastern Asia which have seen fast-growing epidemics. The rate in Cambodia, in particular, has been alarming and the situation there is regarded as the most serious in Asia. The first cases in Cambodia probably occurred in the late 1980s, with the first case recorded in 1991. Between 70,000 and 120,000 people are estimated to be infected in this country with its population of about 10 million.

There are parts of the region, including Indonesia and the Philippines, where — to date at least — the epidemic appears to have been relatively contained.

In India, between 3 million and 5 million people are estimated to be infected with HIV, with seroprevalence rates highest in the south (in Tamil Nadu State) and in the west. In Bombay, HIV prevalence has reached 50 per cent among sex workers, 36 per cent in people seeking care for STDs, 2.5 per cent in pregnant women attending antenatal clinics, and 3.5 per cent among those under age 20. In Manipur and some other north-eastern States, transmission rates have been fuelled by injecting drug use, with prevalences of up to 55 per cent among injectors, and 1 per cent among women attending antenatal clinics. An estimated 3 to 4 per cent of some rural populations have an STD. Between 1 million and 2 million new cases of tuberculosis occur annually in India. In Bombay, 10 per cent of patients presenting with TB are HIV-positive.

Other countries in Asia have a potential for considerable spread. Viet Nam has already had a rapid spread among IDUs: HIV rates among some groups of IDUs rose from 9 to 44 per cent between 1993 and 1995. In China, HIV prevalence is still relatively low. The south-west province of Yunnan, bordering on the Golden Triangle area, where drug injecting is the major route of transmission, contains 70 per cent of China's reported HIV cases. There has also recently been recorded a spread of HIV among IDUs further west, in Sichuan and Xinjiang provinces. However, China has seen

a rapid rise in STDs in the past few years, and there is a danger that a serious HIV epidemic could follow. It has been estimated that the number of HIV-infected people in China rose from 10,000 at the end of 1993 to 100,000 by the end of 1995 (UNAIDS/Family Health International/Harvard School of Public Health, 1996).

Latin America and the Caribbean

Some cities in Latin America have experienced several simultaneous epidemics. A male homosexual epidemic and a heterosexual one have reinforced each other with the link between the two being the high proportion of bisexual behaviour in men. The spread of HIV began early, around 1980 — initially among homosexual and bisexual men, and IDUs. The most affected countries or areas in the region have been Brazil (especially the cities of São Paulo and Rio de Janeiro) and the Caribbean.

In Mexico, two distinct epidemics can be observed: an older one, mainly urban-based, among homosexual men, and an emerging rural epidemic, spread predominantly through heterosexual transmission.

In the Central American isthmus, heterosexual transmission has been the predominant mode of transmission for at least a decade. Honduras, while having only 17 per cent of the population, accounts for 57 per cent of reported AIDS cases. HIV seroprevalence among sex workers in Honduras has reached levels of nearly 40 per cent.

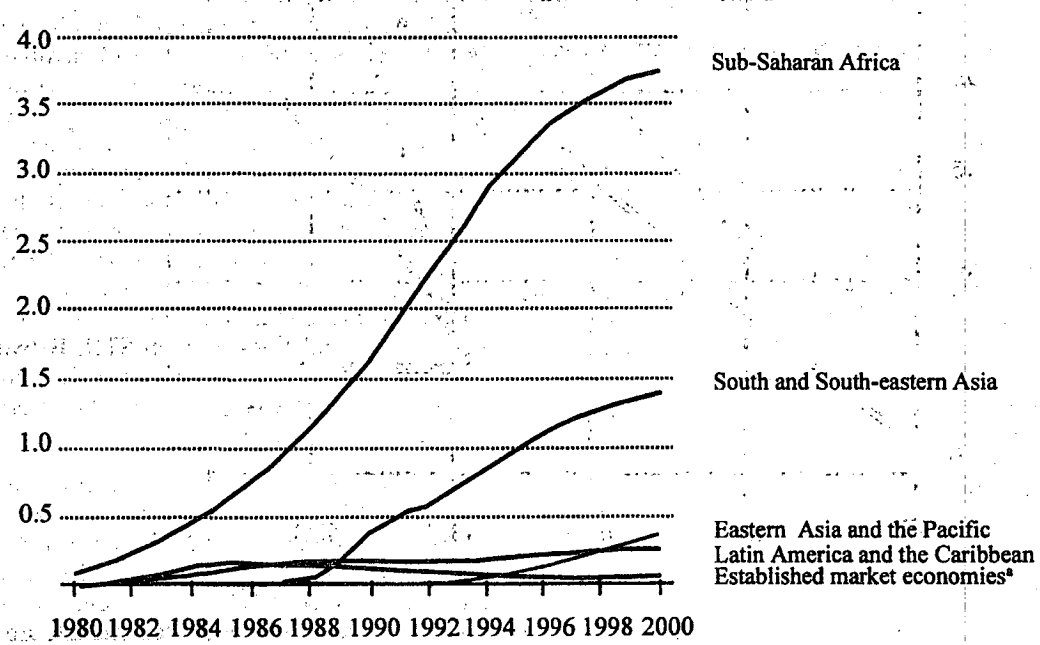
Social, economic and political factors, among others, have fuelled the spread of HIV in the Caribbean. For example, in Haiti, HIV prevalence in the adult population rose from 2 per cent in 1989 to about 5 per cent in rural areas and 10 per cent in urban areas in 1994. In the Dominican Republic, HIV seroprevalence has reached levels of up to 8 per cent in pregnant women in some sentinel sites.

High seroprevalence rates have been reported for specific population groups in South America: 27 per cent among sex workers in Santos City, Brazil; 23 per cent among homosexual men in Rio de Janeiro; and 30-60 per cent among IDUs in areas covered by several urban studies in Brazil and Argentina. In the Southern Cone of South America, IDUs form a bridge in the epidemic with the general population. In São Paulo, AIDS-related illnesses are now the leading cause of mortality in women of reproductive age.

Northern America Western Europe and Australia and New Zealand

In Northern America, though the overall rate of increase in AIDS incidence has slowed in the past few years, there have been considerable variations in the populations affected. In the United States of America, the increase in AIDS incidence in the 1990s has been greatest among women and among economically disadvantaged populations, and for people infected through heterosexual contact as opposed to homosexual and nonsexual modes of transmission.

Figure 14. Annual number of new HIV infections, selected regions
(Millions)



Source: World Health Organization/Joint and Co-sponsored United Nations Programme on HIV/AIDS, *Report on the Global HIV/AIDS Epidemic* (Geneva, December 1997).
[a]Western Europe, Northern America, Australia, New Zealand and Japan.

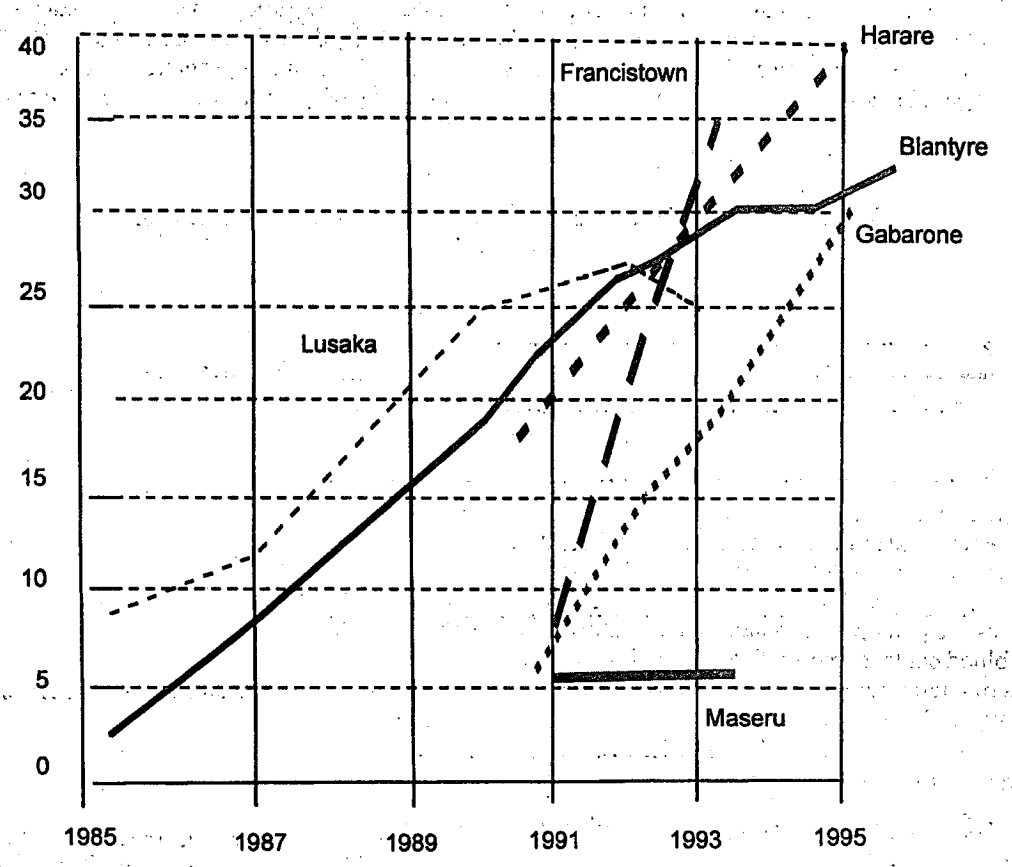
Death rates from AIDS have fallen in the United States in the past few years, largely as a result of advances in therapy. However, as with the incidence of AIDS, the falls in the death rates due to AIDS are not equally distributed between genders and among different population groups. While the death rate for men fell 22 per cent in the first nine months of 1996 against the same period in 1995, the fall for women was only 7 per cent.

HIV rates in Northern American prisons are high: 2.3 per cent of the almost 1 million prisoners in the United States in 1994 were known to be infected, and AIDS was the second leading cause of death among prisoners. In Canadian prisons, HIV prevalence is higher among women than among men — 2-10 per cent as against 1-4 per cent.

In Northern America, AIDS incidence among children has declined annually since 1992. HIV incidence has also declined among homosexual men — in Canada the figures fell from around 5-10 per cent per year in the early 1980s to an estimated 1-2 per cent per year in the early 1990s.

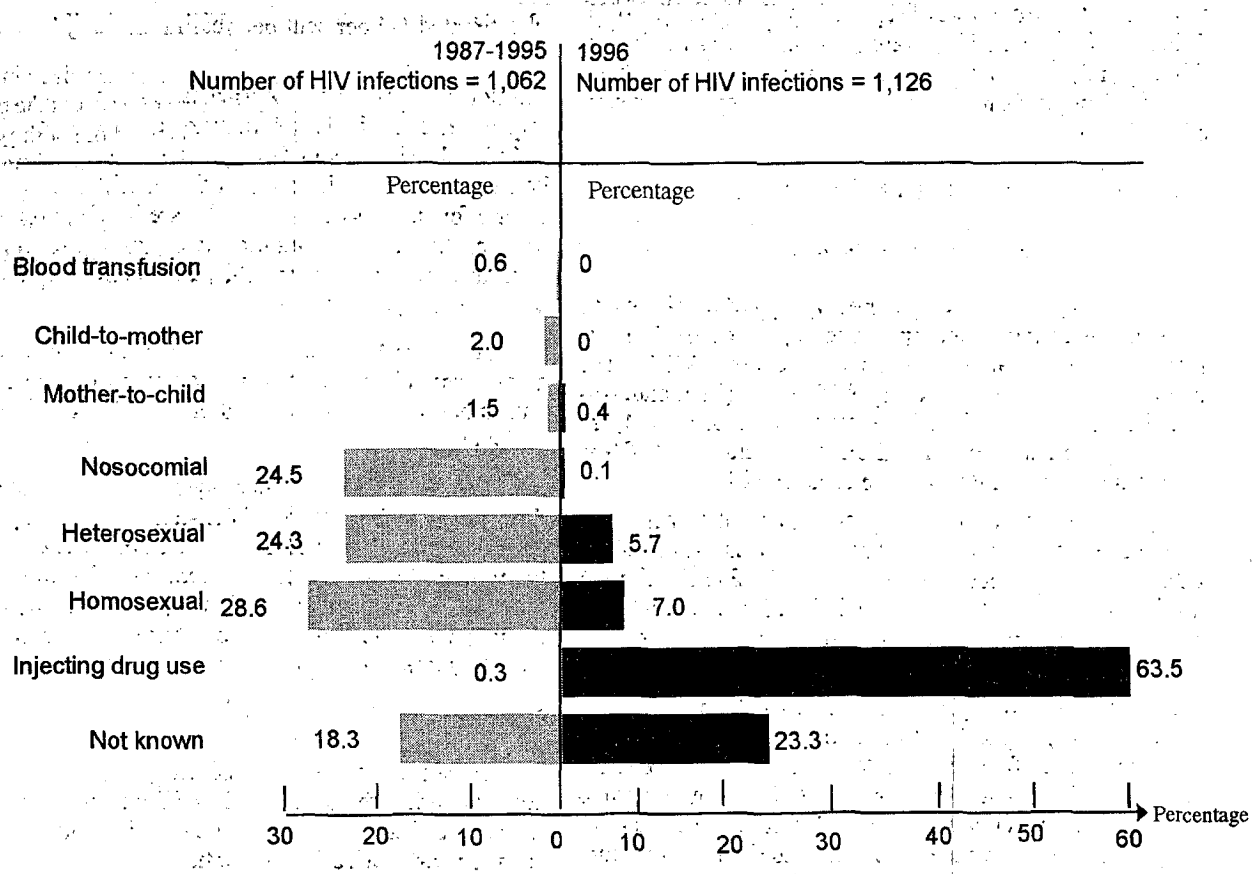
In Western Europe, AIDS incidence has stabilized in several countries in the north-west part of the continent in the past few years, while it continues to rise in countries of south-west Europe. In Spain and Portugal in particular, injecting drug use has contributed to the continuing spread of HIV. Prevalence among Western European women is relatively low: the highest rates (between 1 and 4 per thousand) have been recorded in urban areas in France, Italy, the Netherlands, Spain and the United Kingdom of Great Britain and Northern Ireland.

Figure 15. HIV prevalence in pregnant women in Southern Africa
(Percentage)



Source: World Health Organization/Joint and Co-sponsored United Nations Programme on HIV/AIDS (Geneva).

Figure 16. Distribution of HIV infections by modes of transmission in the Russian Federation, as of 31 December 1996



Source: HIV-infection Surveillance in Russia in 1987-1996 (Statistics) (Russian AIDS Centre, 1997).

In Australia and New Zealand, over 85 per cent of infections are reported to have been acquired through sexual contact between men. While HIV rates in Australia are low among people who inject drugs, the ongoing hepatitis C epidemic shows the potential for a substantial outbreak of HIV through blood contact among IDUs. There is evidence that HIV infection rates have reached a plateau in Australia and are declining in New Zealand.

Central and Eastern Europe, and Central Asia

In parts of Central and Eastern Europe, there are rapidly developing epidemics, fuelled by a variety of forces, including political and economic transition and its impact on lifestyles, expectations and health services. Large outbreaks of HIV infection related to injecting drug use have been reported in several countries — first in Poland and the former Socialist Federal Republic of Yugoslavia, in the late 1980s, and more recently in Ukrainian cities along the Black Sea coast. For the significant part that injecting drug use is now playing in the epidemic in the Russian Federation, see figure 16. In several Eastern European countries, the dual epidemics of TB and HIV/AIDS have formed a deadly partnership, each reinforcing the other.

In countries of the former Soviet Union, there has been a large increase in STDs. For instance, while annual incidences of syphilis in Western European countries have dropped since 1980 to below 2 per 100,000, they have risen very sharply since 1990 in many of the newly independent States, 15- to 60-fold in some countries, and in other parts of Eastern Europe. In 1995, incidences of syphilis were 172 per 100,000 in the Russian Federation (320 per 100,000 in Saint Petersburg), 147 per 100,000 in Belarus, 173 per 100,000 in the Republic of Moldova and 123 per 100,000 in Kazakhstan.

The Romanian hospital outbreak of HIV infection among children, which began in the late 1980s, has accounted for over a half the 6,060 paediatric AIDS cases reported in Europe.

Northern Africa and the Western Asia

Although information on the region is relatively sparse, the empirical evidence shows that HIV prevalences are relatively low. Three quarters of reported cases have come from Djibouti, Morocco, Saudi Arabia, the Sudan and Tunisia. In Djibouti, rates of 9.3 per cent in pregnant women have been recorded. Increases in STD rates have been reported in several countries.

C. Impact of the HIV epidemic

1. *Demographic impact*

Unlike most other diseases, the majority of deaths due to AIDS occur during the most productive years of life. In Thailand, for example, about 80 per cent of reported AIDS cases have been in people between ages 20 and 49 (Thailand, National Economic and Social Development Board, 1994). In some large cities in the United States and Europe, AIDS is the leading cause of death among menaged 15 to 49 years.

High levels of AIDS in the general population can jeopardize previous gains in child survival. It is estimated by UNAIDS, for instance, that in Asia and the Pacific, about 5 million women may have become infected by the year 2000, and that some 2 million children may have acquired HIV infection, most of whom will have died by that time.

Recent projections (United Nations, 1998: chap. II of the present report) suggest that life expectancy in sub-Saharan countries most affected by HIV/AIDS will have been reduced by as much as 15 years by 2000, when compared with projections without HIV/AIDS. Infant and child mortality rates have risen and may continue to rise in many countries as a result of AIDS.

Studies have also been carried out on the effect of AIDS on fertility rates and consequent population growth. A study of rural households in eastern Zimbabwe has provided solid evidence for reductions in fertility associated with the HIV epidemic (Gregson, 1994). A study in the Masaka district in Uganda showed that women infected with HIV had 20 per cent lower fertility than uninfected women (Carpenter and others, 1997).

Responses to the HIV epidemic, and in particular changes in sexual behaviour can work in both directions with regard to fertility. Unprotected sex can result both in pregnancy and in the transmission of HIV and other STDs. At the same time, changing behaviour to avoid HIV — including using condoms or deliberately avoiding pregnancy on the part of women who think they may be infected and do not wish to pass on HIV to their baby — can also affect fertility negatively. On the other hand, other responses to the HIV epidemic may increase fertility — such as national programmes to identify and treat STDs.

2. *Social and economic impact*

Individuals and families

Individuals and families face direct and indirect costs. The direct costs include payments for medical care — often extremely high, where drugs are available. Indirect costs are items such as the loss of income, where a person with HIV infection is prevented from working. Families adopt a variety of strategies to adapt to declining income and rising medical costs, including withdrawing children from school to save fees, and sending children to live with relatives or friends.

Studies in sub-Saharan Africa have shown that the social impact on individuals and families can be overwhelming. Individuals with HIV or AIDS, and often their families, can be ostracized by their communities. Children leave school to care for siblings or parents who are ill. Children become orphans. In some communities, it is common for the grandparents to care for children, the parents having become part of the missing generation.

Deaths from AIDS lead to the redistribution of household assets, which in some societies can result in the disenfranchisement of women and children, and the loss of their inheritance.

HIV/AIDS has a particular psychosocial impact on children, who may have suffered the stress of attending to an ill and dying parent over a long period of time. They then face the possibility that the other parent will also die — given the probability that HIV may have spread sexually between the father and the mother — something that would be considerably less likely with other fatal conditions.

National costs

Countries who choose to subsidize most or all of the health costs of caring for people with HIV and AIDS face enormous expenditures — something that in itself justifies money spent on early, effective prevention.

The economic impact of the AIDS epidemic on a country includes the loss of production through morbidity and mortality, as well as the decline of infrastructure — in the health and educational sectors especially. When medical staff become ill or die, or are preoccupied full-time as carers for sick relatives, pressure on the health services is increased. In some countries, HIV has already had a major impact on an already precarious health service. In Zambia in 1992, for instance, close to 40 per cent of health-care workers were themselves HIV-positive (Fylkesnes, Brunborg and Msiska, 1994).

The depletion by AIDS of the ranks of teachers and lecturers has an immediate impact on the education of children and young people, and itself affects a country's future development. Losses to the industrial labour force harm the energy, communications, construction and mining industries. A community's (or country's) ability to feed itself can be imperilled by serious losses of labour in the rural workforce.

A study on India, Indonesia and Thailand has shown that the AIDS pandemic will contribute to increased economic inequality in these countries because it disproportionately affects low-income groups and because public and private institutions that could spread the costs of the epidemic (such as health insurance and social welfare) are relatively limited in these countries and do not reach the majority of the population (Bloom and Glied, 1993). The same study measured medical costs related to AIDS and estimated a total cost per

case of US$ 738 in India and US$ 1,490 in Indonesia. (These figures assume treatment of AIDS-related illnesses only, and exclude, any triple therapy, the cost of which — for drugs alone — is between US$ 12,000 and US$ 15,000 per year).

A simulation study on the economic impact of HIV/AIDS on the Kenyan economy suggests that Kenya's GDP could be 14.5 per cent smaller in 2005 than it otherwise would have been without AIDS (Hancock and others, 1996). Per capita income was projected to be reduced by 10 per cent. In terms of sectoral employment, the study predicts that with AIDS, the formal sector will encompass 13 per cent of total employment in 2005, as against the 15 per cent that would have been encompassed otherwise, a significant reversal in formal job creation.

D. Responses to the epidemic

1. *An expanded response*

Responses to HIV deal with prevention and care, and the two have become increasingly closely connected as the pandemic has progressed. Nearly all countries have made some response to the problems and threats that have accompanied the global spread of HIV infection. The response has often been directed by the health ministry, the national AIDS programme and in some cases by national leaders, such as those chairing the national AIDS committee. In many cases the response has been strongest in the communities most affected by the virus — local community groups, groups of self-identified gay men, associations of people living with HIV and AIDS, or groups of sex workers.

The experience of the HIV pandemic over two decades has shown that there are responses to the disease and its impact that work, and that can effectively reduce transmission and lighten the burden of HIV and AIDS on individuals, families and communities. Solutions, however, that have worked well in one place, or for one group of people, at one point in the epidemic, may not necessarily do so under different circumstances. They may need to be modified if they are to be successfully introduced elsewhere.

Success on a national level involves making optimum use of often limited resources, and of finding ways of bringing more resources and active partners into the national response from different sectors of society and of the economy — an expanded response to HIV and AIDS. Taking advantage of the relative strengths of different groups — both private and public — when planning actions is more likely to produce the best results at lowest cost. The expanded response in a particular country involves activities for both long-term and short-term results, and seeks to increase the coverage of programmes so that they have sufficient impact to change the course of the epidemic in that country.

Ideally, the strategic planning process required to formulate the best response does various things. It focuses on a country's major needs and looks for appropriate solutions. It aims to borrow and adapt best practice. This helps to ensure local success and thus contribute further to the lessons already learned from the epidemic. The strategic planning process also aims to mobilize in an efficient way the strengths of all social and economic groups and administrative structures, and in particular to strengthen the planning and budgeting capacities of all the sectors and agencies involved. The whole process should be sufficiently flexible to cope with the changing nature of the epidemic. Finally, the process should encourage participation, advocacy and coordination.

2. *Efforts at behaviour change*

As the overwhelming proportion of HIV infection occurs through sexual acts or injecting of drugs, behaviour change is a prime response in seeking to prevent transmission.

Prevention efforts seeking to change sexual behaviour include encouragement of the use of condoms; switching to other so-called "safer sex" techniques that do not involve penetration; and reducing the number of sexual partners, including encouragement of mutually monogamous sexual relationships. The last of these — reducing the number of partners or maintaining monogamous relationships — is likely to be more limited in its effectiveness than the other two methods, unless the relationships are long-term and truly monogamous.

Strategies employed with respect to changing injecting drug use behaviour include discouraging the injecting of recreational drugs; encouraging the use of a disposable sterile needle and sterile syringe on every occasion and the refusal to share equipment; and encouraging effective sterilization of needles and syringes, using concentrated liquid bleach, after every use. The last two of these strategies — involving using disposable, sterile injecting equipment and sterilizing injecting equipment effectively with liquid bleach are known as "harm minimization" policies. They recognize, that in practice, it is difficult to stop many drug injectors from injecting, and that it is better to reduce the very high risks of HIV transmission and of the transmission of other serious infections, such as hepatitis B and hepatitis C associated with injecting. Harm minimization policies should ideally consist of a comprehensive set of activities that includes the provision of information, peer education, skills training and counselling.

The essential goal of prevention programmes is to identify populations engaging in sexual or needle sharing risk behaviours and to provide them with a combination of the knowledge, skills, tools and supportive environment needed to change those behaviours and thus reduce their risk. For practical reasons, prevention programmes are usually designed in terms of identifiable segments of the population determined — by means of studies or through accurate local knowledge of the situation — to be at heightened risk.

In designing a comprehensive programme to reduce risk in the population as a whole, it is important to remember that all population segments — whether defined by occupation, age, sexual orientation or other characteristics — have some risk behaviours (related to sexual behaviour or injecting drug use). The level of risk in any particular population segment can vary greatly from one country or region to another, or from one time to another. For example, sex workers in Europe and the United States currently have a very

low sexual HIV risk because of high levels of condom use, while sex workers in many parts of Africa and India have little control over condom use and are at great risk. Even within definable population segments, there are wide variations in risk behaviour. For example, studies have shown that among gay men in San Francisco, older men in general, regularly take precautions to prevent HIV transmission, while many younger men often do not; thus, increased emphasis on prevention efforts among the younger men are required.

Consequently, in deciding where to target existing resources to produce the greatest risk reduction, it is essential to determine the current extent of risk locally in the various population segments. It is then necessary to establish prevention programmes with good coverage for as many of these segments as available resources allow, starting from those at higher risk. In prioritizing and designing these programmes, other factors such as relative cost and proved efficacy of changing behaviours in various subpopulations must be kept in mind. For example, programmes targeting young people who have yet to form their sexual behaviour patterns can be very cost-effective in terms of producing lifelong patterns of lower-risk behaviour. Programmes among military populations or in the workplace may be relatively inexpensive because these people are easily reached through an existing infrastructure.

Programmatic responses must also be dynamic, because conditions change over time. Some people may reduce their risk behaviours significantly in response to prevention programmes or community pressures. Others may be less responsive to these programmes, or even revert to past higher-risk behavioural patterns. This means that programmes need continually to monitor behaviours, periodically re-examining the prevention needs within each segment, and adapting prevention activities to changing conditions. Successful programmes need to be sustained as well in order to maintain the change to low-risk behaviour they have achieved.

To be successful, interventions to change behaviour should concern themselves with the totality of each person's health, and not just with a single aspect or disease. They should thus cover such areas as reproductive health, STDs, HIV/AIDS and psychosocial health. In addition, they should aim to build life skills and not simply offer sets of instructions — thereby enhancing people's capacity to analyse their situations, make judgements, take decisions and take appropriate action.

Types of prevention programmes

Programmes aimed primarily at reducing risk behaviour can take a variety of forms. One of these is media campaigns — using both the mass media (including television, radio, newspapers and magazines) and the "small media": videos, audio cassettes, posters and pamphlets.

Another type of prevention activity is peer education. This uses current members of the affected community. Another method is outreach work, where a mixture of trained professionals (from the social or medical fields) and trained volunteers go out to find their target group. Outreach work is used particularly in cases where the target group is hard to locate. The face-to-face methods used in both these approaches afford privacy and confidentiality, and enable the person being targeted to ask questions, the latter being an advantage not generally possible with mass media campaigns. They also enable the educator to train the person. Peer education is useful for many groups, including adolescents and young people who tend to listen to their friends.

Even with knowledge and awareness of HIV, and a will to change behaviour, safe sex is not always possible. Women in particular are often not in a position to insist on condom use or other safer sex practices. Teaching negotiating skills and how to make good decisions is therefore often an important element of face-to-face prevention programmes.

Given the vulnerability of young people to HIV and other STDs, society needs to do more to help children protect themselves, by educating them in schools, at home and through the mass media. Even though they may be at no risk today, in the not-too-distant future they may become at risk; educating children on AIDS while they are at school is thus, among other things, an effective investment in their future. For the growing number of children attending school, schoolteachers — properly equipped and trained for the task — can take on this role (see box 7).

Continuing research

More and continuing research is needed on sexuality, sexual behaviour and drug use, so as to better understand sexual identities, beliefs and cultures. How people see themselves has deep implications for the lives they lead and the steps they may take to protect themselves and others from infection. Too little is known about the ways in which gender power, homophobia and fears about sex affect the ways in which people understand themselves sexually and the expectations and beliefs people have of each other. Research results need constantly to be fed into policy-making, and into the planning and implementation of programmes.

3. *Condom use*

The provision of condoms is a leading and indispensable component of many HIV prevention programmes. The traditional condoms are the male condoms, made of latex and intended for a single use. Using them correctly is important, as incorrect use can lead to breakage or slippage. For this reason, instructions on correct condom use are often provided on the packaging — and are an important part of HIV education programmes.

Strenuous efforts have been made in recent years — including through their social marketing — to make high-quality condoms available and affordable to as many people as possible, in developing and developed countries alike.

The female condom is a relatively recent development, first proposed in the mid-1980s and now available commercially in many countries. Made of clear polyurethane plastic, it is strong and durable, and can be inserted even hours

before intercourse and does not have to be removed immediately afterwards. For women, use of the female condom can give more control in the practice of protected sex, even though the agreement of both partners will usually be required.

A UNAIDS study in 1995 in Thailand showed that availability of the female condom could reduce the amount of unprotected sex. In the study, some groups of female sex workers were given male condoms only, while others were given both male and female condoms. Those given both had less unprotected sex and developed one-third fewer STDs than those given only the male condom.

Since 1989, Thailand has pioneered the policy of aiming for 100 per cent condom use in all sex encounters in brothels (see box 8), a policy that has achieved considerable success.

4. *HIV testing and counselling*

Counselling aims to reduce psychological stress and to help individuals make their own decisions and take actions appropriate to their personal situations. It is important in relation to HIV infection and has proved effective in various ways. Counselling is often given in connection with a voluntary HIV test. Such counselling seeks to explain the logistics of the test and the implications of knowing that one is or is not infected with HIV. It can also involve a discussion of sex- and drug-related risk behaviours and how to prevent HIV infection. Whenever resources permit, pretest counselling should be made available to those who desire it. Those who do not want or do not have access to pre-test counselling, however, should not be prevented from taking a voluntary HIV test.

In post-test counselling, the test result is given to the client and discussed. If the result is positive, the counsellor will offer emotional support and discuss with the client how best to cope. HIV results should always be given with counselling.

Voluntary HIV testing accompanied by counselling has a vital role to play within a range of HIV prevention activities and should be encouraged. It is essential, though, that there is always informed consent and confidentiality in all situations (including clinical care, research and the donation of blood) where an individual's identity will be linked to his or her HIV test results.

HIV home collection tests in which specimens are collected at home and sent off for analysis and self-test kits offer the advantage of enhanced access and anonymity. However, these tests may have serious negative consequences — especially if they are not connected with confirmatory testing and with counselling and care services, or if they are applied coercively, such as to people seeking employment or insurance policies, or to spouses or sex partners. Licences for commercial home tests should be continuously reviewed. Quality assurance should be strengthened and strict safeguards imposed on potential abuse before licences for such tests are given.

Box 7. Learning life skills: Zimbabwe's school AIDS education programme

In Zimbabwe, all schools since 1993 have had a weekly compulsory lesson on life skills and AIDS for all students from grade 4 (9 to 10 year-old children) upwards. Booklets for students and teachers are designed to be appropriate for each grade, and address four main themes: relationships, growing up, life skills and health. Topics range from stereotyped gender roles to coping with emotions and stressful expectations. In the classroom, life stories, letters to newspaper "agony aunts", articles and cartoons are all used to spark off group discussions and activities.

The discussions of adolescents cover subjects such as love, friendship, sexual abuse in the family, sugar daddies, their plans for their future, and how pregnancy or disease could disrupt those plans. Self-esteem and assertiveness are particularly encouraged, and role playing suggests ways to respond to peer pressures. Apart from using booklets in the classroom, students also carry out projects in the community.

All the materials are reviewed and approved by a committee that includes the National AIDS Programme, the ministry of education, and representatives from the major religious denominations. A large teacher training programme helps prepare serving teachers, as well as students in teacher training colleges.

BOX 8. THE 100 PER CENT CONDOM USE PROGRAMME IN THAILAND

HIV began to spread rapidly in 1989 within the Thai population, owing in great part to the practice among a large number of Thai men of visiting prostitutes regularly. Up to the late 1980s, the use of condoms in such encounters was virtually unknown.

The Thai Government's 100 per cent condom programme began in August 1989 in Ratchaburi and Khon Kaen provinces, and by 1992 all 73 provinces were participating in the programme. The aim was to achieve as close to 100 per cent condom use as possible in commercial sexual encounters, especially in brothels.

The programme was introduced with the knowledge that information and education alone, while important, were insufficient to prevent the rapid spread of HIV. It had been observed that sex workers generally knew about AIDS and wanted their clients to use condoms, but were unable to enforce this practice. Brothel owners, in addition, often pressured sex workers to meet their clients' demands.

The authorities sought the cooperation of brothel owners, trying to persuade them to have their workers use condoms in all encounters and if a customer refused, to withhold services from him. An important part of the programme was to ensure that all owners of sex establishments in a particular area implemented the policy at the same time, so that customers could not threaten to go elsewhere. Meetings were arranged at provincial level between officials (including health officers, police and local authorities) and all sex establishment owners, who were educated about the severity of AIDS and the situation in their province. They were encouraged to instruct their workers to use condoms, which the Ministry of Public Health would supply free of charge. Furthermore, the brothel owners were informed that condom use would be monitored, and that the penalties for those found not complying would include temporary or permanent closure of their establishments. Such monitoring would be done by enforcing regular check-ups at STD clinics among the sex workers.

The results were highly encouraging. Between 1990 and 1993, the proportion of the male population visiting sex workers dropped from 30.4 to 13.4 per cent in Bangkok; from 25.2 to 10.6 per cent in the central region; from 26.3 to 10.1 per cent in the northern region; from 14.1 to 8.7 per cent in the north-east; and from 27.3 to 12.3 per cent in the south. Furthermore, in the same period, each region of the country saw a large increase in the percentage of men buying sexual services who reported always using condoms: from 38.2 to 90.2 per cent in Bangkok; from 27.9 to 62.8 per cent in the central region; from 33.6 to 69.7 per cent in the north; from 16.7 to 63.3 per cent in the north-east; and from 52.1 to 79.5 per cent in the south (Brown, and *others*, 1997).

Similarly, with STDs, in 1989 the national incidence was 6.5 per thousand of the population, after which it dropped steadily each year, to reach 2.07 per thousand in 1992 and 0.73 per thousand in 1995. The rate of HIV infection among young military recruits declined from 4.0 per cent in May 1993 to 1.9 per cent in November 1996.

Recently, the programme has been strengthened in some places with the promotion of free lubricants, in small sachets, and the Ministry of Public Health is also considering adding the female condom to the programme. The programme was accompanied by mass awareness campaigns, extensive prevention programmes to reach potential clients at their workplaces, an energetic condom quality control programme and improved STD services. These additional activities, on the one hand, and the condom policy, on the other, should be seen as complementary aspects of the same programme, neither of which on its own would have been so effective.

Counselling not related to HIV tests

Ongoing counselling for HIV-seropositive people, a form of psychological support, is often given — either following up on from a positive test result or through the person's having developed clinical symptoms of AIDS. HIV counselling — even without HIV testing — can augment other forms of AIDS education and encourage behaviour change. The environment in which such counselling takes place is often more private, confidential and personally directed than that afforded by other channels of education.

Children are increasingly affected by the epidemic, and often they have special counselling needs. Apart from those themselves infected, they also include children one or both of whose parents are either living with HIV or AIDS or have died of AIDS.

Counselling can benefit pregnant women, or those wanting to become pregnant, who are either HIV-positive or unaware of their status — helping them make informed decisions about whether to become pregnant if HIV-infected and whether to take a test before pregnancy. For those already pregnant, counselling can discuss the use of zidovudine to reduce the risk of transmitting the virus to the unborn child.

5. *Safe blood supply and sterilized medical instruments*

Millions of lives are saved each year through blood transfusions. Various shortcomings, however, in the way blood is collected, tested — or not tested — for infections such as HIV, and transfused, mean that people in many countries have an increased risk of becoming infected with HIV and other diseases through transfusions. It is estimated that between 5 and 10 per cent of all HIV infections worldwide have been contracted through transfusion of contaminated blood and blood products. If the proper steps are taken, such infections can easily be prevented.

HIV and other transfusion-transmissible infections (TTIs) can be eliminated or substantially reduced through a blood safety programme that ensures a number of conditions. These include the setting up of a national blood transfusion service, accountable to the Government or a government-appointed non-profit organization, with its own budget and trained staff.

A second important condition is that all donated blood come from unpaid, voluntary, low-risk donors. Paid donors are common in developing countries — often coming from the poorest sectors of society and frequently in poor health, undernourished and at risk of having TTIs. Unpaid, voluntary, low-risk donors should be recruited, educated about what it means to give blood, motivated and retained in the system, so that they give regularly at properly spaced intervals. All donated blood should be screened for all the main TTIs, and especially for HIV and hepatitis B virus.

Inappropriate blood transfusions should be minimized, and people who prescribe blood should be trained to avoid unnecessary or inappropriate transfusions. Blood transfusions — often given for chronic anaemia — are unnecessary if the underlying condition is treated and the patient given corrective therapy. Preventing diseases such as malaria and worm infestations, and raising health standards generally, are important measures to reduce unnecessary transfusions. Similarly, there should be proper care for women before, during and after delivery, where blood loss can be greatly reduced, in turn reducing the need for transfusions.

The availability and accessibility of blood substitutes for volume replacement such as crystalloids and colloids, for use where appropriate, should be ensured. These will not transmit infections and can be obtained at a fraction of the cost of whole blood.

All instruments used in surgery (including dental surgery) should be properly sterilized, according to the appropriate guidelines. Similarly, all injections in a health-care setting should use either disposable, single use needles and syringes, or else needles and syringes that have been properly sterilized.

6. *Therapies for HIV infection*

While HIV infection is not presently curable, it is now clear that its course can be delayed significantly with combination antiretroviral therapy. Moreover, there is a range of treatments available to prevent and treat the opportunistic infections and malignancies that affect people whose immune system has been weakened by the virus. There is also prophylactic antiretroviral therapy, which seeks to reduce the likelihood of HIV infection is taking hold following exposure to the virus. The problem in many countries, however, is one of accessibility, given the lack of availability and/or affordability of many of the treatments.

Prophylactic therapy to prevent HIV infection

Since 1994, treatment with zidovudine (ZDV, also known as AZT) — the first of the so-called antiretrovirals — has been increasingly used to prevent mother-to-child transmission of HIV. This followed the demonstration that ZDV, taken by the mother during the last four to five months of pregnancy and during childbirth, and given to the newborn for six weeks, reduced the risk of mother-to-child transmission from 25 to 8 per cent in the absence of breastfeeding. This regimen is now widely used in most developed countries, but the fact that it costs approximately US$ 1,000 per treatment course — together with logistic problems and uncertainty about its efficacy among women who breastfeed — limits its utilization in developing countries.

Antiretroviral therapy is also used to reduce the risk of HIV infection after exposure to the virus (known as post-exposure prophylaxis) in developed countries. Health-care workers are at risk of HIV infection when — while incurring needle-stick injuries — they become exposed to blood or other secretions from HIV-infected patients. The risk of infection after a needle-stick with HIV-infected blood is around 0.3 per cent. The administration of zidovudine as fast as possible — and within 24 hours — after a needle-stick reduces the risk of HIV infection by 79 per cent. It is possible that combination antiretroviral therapy might be more effective. The recom-

mendations in the United States and Europe since 1996 have been to use combination antiretroviral therapy to prevent HIV infection when health-care workers are accidentally exposed to HIV-infected materials.

Zidovudine has also been used as post-exposure prophylaxis after sexual exposure (or possible exposure) to HIV, but this use of antiretroviral treatment is at present still controversial.

Treatment of HIV infection with antiretrovirals

There are currently 11 antiretrovirals available in developed countries. They fall into two broad classes: reverse transcriptase inhibitors (of which zidovudine was the first, beginning in 1987), which function by inhibiting the enzyme reverse transcriptase used by HIV to transcribe its RNA into DNA; and protease inhibitors, which work by inhibiting the enzyme known as HIV protease, thereby interfering with the assembly of new HIV particles in already-infected host cells.

Antiretrovirals are used mainly to slow the progression of HIV infection. Up to 1996, therapy with antiretrovirals for this purpose was with a single drug (traditionally zidovudine). The announcement in 1995 of the results of two-drug combination therapy trials led to monotherapy is being abandoned. Currently, triple therapy (two reverse transcriptase inhibitors plus a protease inhibitor or a non-nucleoside reverse transcriptase inhibitor) — which has a more profound effect on viral replication than double therapy — is recommended as the standard of care in the United States. Other countries have been more hesitant to make the step to triple therapy, because of uncertainty about how long it can delay the progression of HIV infection and prolong survival, and because of its high cost (between US$ 12,000 and US$ 15,000 per year for the drugs alone). It is still unknown whether triple therapy can cure HIV infection.

Apart from the high cost, antiretroviral therapy also has other drawbacks. Some antiretroviral regimens demand that a treated person should take as many as 15 tablets a day according to a complicated timetable. Antiretrovirals can also have serious side effects, and there are interactions between these drugs and medications used to treat some opportunistic infections. The regimens need to be monitored, for efficacy and for possible toxicity of treatment, and such monitoring requires several outpatient visits a year. All these problems make antiretroviral therapy poorly accessible in most developing countries, though some of the richer ones, such as Brazil and Argentina, have effective programmes to provide free treatment to their HIV-infected populations.

Prevention of opportunistic infections

When the immune system of people with HIV infection weakens, it is recommended that they should take prophylactic treatment against the opportunistic infections that are common in their geographical area. The importance of isoniazid therapy as a cost-effective method to prevent tuberculosis has already been mentioned above. Preventive therapy against pneumocystis carinii pneumonia (PCP) is also strongly recommended in HIV-positive individuals whose immune system is severely weakened. Preventing (or treating) PCP need not be very expensive. The drugs generally used are either TMP/SMZ or pentamidine. Prophylaxis with TMP/SMZ also offers protection against toxoplasmosis. Prophylaxis is also possible for Mycobacterium avium complex disease (MAC), though the cost is high.

Treatment of opportunistic infections

Most opportunistic infections can be treated, though with varying degrees of effectiveness, and at varying costs. Diagnosis of toxoplasmosis — which seems to occur in a significant proportion of AIDS patients — needs sophisticated equipment, and treatment of the disease is also expensive.

Candidiasis is treated either topically or systemically with antifungal drugs, such as nystatine, miconazole, ketoconazole, itraconozole, fluconozole and amphoceterin B. Systemic mycoses such as cryptococcosis cause around 5 per cent of all HIV-associated deaths. Cryptococcosis is relatively easy to diagnose, though its treatment (with amphoceterin B or fluconozole) is often impossible in developing countries because of the high cost and limited availability of the drugs required. MAC infection can be treated using a combination of drugs, which — as with MAC prophylaxis — are costly. With cytomegalovirus infection, treatment aims to improve quality of life and to prevent blindness, rather than to provide a cure.

Treatment for Kaposi's sarcoma — it causes dark blue lesions which can occur in a variety of locations, including the skin, the mucous membranes, the gastrointestinal tract, the lymph nodes and the lungs — depends on the symptoms and location of the lesions. For local lesions, injection therapy with vinblastine has been used with some success. In sites more difficult to reach — such as the inner mouth, eyes and face — radiotherapy can be employed. For severe widespread disease, especially where the lung is involved, systemic therapy is the preferred method.

7. *Access to drugs*

The AIDS pandemic has brought increasing urgency to the already high-profile issue of access to drugs. Apart from drugs for prophylaxis and treatment of HIV-related conditions, there is an increasing need for painkillers, tranquillizers and palliative drugs to relieve the suffering those conditions cause.

Each region faces a different set of barriers to access to drugs, varying greatly from country to country. The countries at present most seriously afflicted by HIV/AIDS are also, for the most part, those whose populations have limited access to even the basic drugs on the WHO Model List of Essential Drugs. This is particularly the case in sub-Saharan Africa, South and South-East Asia and the Caribbean and, to some extent, in Latin America as well.

Even where social attitudes are favourable and political will exists, providing all the necessary drugs to all HIV-seropositive people is not possible for countries with high

HIV prevalence and low financial resources. Given that full access to all such drugs will not be realizable in the short term, health systems will be forced to ration the provision of some drugs. This gives rise to ethical and practical questions regarding the criteria to be used in deciding who receives treatment.

Certainly, the continuing spread of the HIV epidemic calls for expanded access to care and treatment. As part of this expansion, increased access to drugs must be supported by an adequate health-care infrastructure which ensures rational use of these medicines. Increased access to HIV-related drugs also requires pricing policies that accord with the economic reality of a country.

In increasing access to drugs, it is necessary to develop partnerships between the key actors at global, regional, country and local levels, and to involve both the public sector and the private sector, particularly the pharmaceutical companies. People living with HIV and AIDS play a crucial role in this process (elaborated in section 10 below).

8. *Vaccines*

With almost 9,000 new HIV infections occurring in the world every day, there is an urgent need to develop new prevention technologies to complement the ongoing behavioural interventions. Vaccines are among the most cost-effective interventions for infectious diseases, and many people believe that a safe, effective and affordable preventive vaccine will be required to bring the HIV/AIDS epidemic under control, especially in developing countries, where more than 90 per cent of all HIV infections are occurring.

HIV is one of the best-studied viruses. The knowledge gained from these studies has guided the design of different types of candidate (experimental) vaccines. Some of these are based on surface components of the virus (gp120 or gp160, where gp stands for glycopistein). Others are based on short synthetic parts (peptides) of the virus. More recent candidate vaccines are being developed by inserting viral genes in live bacterial or viral vectors, or even using the purified viral genes as the vaccine. Very importantly, many of these candidate vaccines have been shown to protect animals (chimpanzees and monkeys) against infection by HIV (or by the analogous simian immunodeficiency virus, SIV).

The most promising candidate vaccines have been tested in Phase I/II on humans, to assess their safety and immunogenicity (that is to say, their ability to induce anti-HIV immune responses). Since 1987, more than 3,000 human volunteers (mostly in the United States) have participated in more than 20 Phase I/II trials of approximately 15 candidate vaccines. With the support of WHO and UNAIDS, developing countries are also preparing the infrastructure, and conducting preparatory research, for the future conduct of large-scale Phase III efficacy trials of selected candidate vaccines. Phase I/II trails are already being conducted in several developing countries (Brazil, China, Cuba and Thailand), in preparation for future Phase III trials. Phase III trials are essential to ascertain whether a candidate vaccine can indeed protect those vaccinated against HIV infection and disease. It is expected that at least three different types of HIV candidate vaccines will be tested in Phase III trials within thenext 10 years. Only then will one know how effective these vaccines are. The sooner Phase III trials are initiated, the sooner one will have the answers needed.

9. *Microbicides*

In the absence of a cure for HIV infection, prevention currently remains the best option with respect to containing the impact of the HIV epidemic. None of the potentially useful avenues of such prevention, therefore, should be ignored. Like vaccines, topical microbicides are among such possibilities. Topical microbicides are products intended for vaginal or rectal administration, and their purpose is to destroy HIV and other micro-organisms causing STDs.

The discovery of an effective microbicide would be of enormous benefit, especially to women. Women generally have even more difficulty than men in avoiding risky partnerships and in negotiating condom use when they perceive themselves at risk of HIV infection. Except for the female condom, which is expensive and the use of which cannot be concealed, women currently have no method to protect themselves against HIV infection or STDs.

One type of microbicide already available over the counter encompasses a range of spermicides — intended primarily for contraception — including nonoxynol-9 (N-9), oxtoxynol-9 and other substances. These are all biodetergents whose property of disrupting cell membranes is responsible for their spermicidal activity, and their in vitro activity against HIV and other causes of STDs, as well as their ability to cause ulcers in the genital tract. While the first two properties might decrease HIV transmission, the third could in fact increase it. It is therefore vital that the efficacy of potential microbicides be established in well-controlled clinical trials. Two such trials on the effect of N-9 have been completed to date, and have failed to show protection against HIV or other STDs. Two further trials on N-9 using formulations different from those in the unsuccessful trials are currently in progress. Other types of microbicides (such as less toxic spermicides, adhesion inhibitors, antiretroviral products and protegrins) are also being investigated. It is expected that in the next few years there will be a start on efficacy testing in humans of at least two newly designed microbicides.

10. *People living with HIV and AIDS, and non-discrimination*

Those living with HIV and AIDS — apart from suffering frequent discrimination in the form of rejection by spouses, sex partners, families and local communities — are also often discriminated against by government or private sector bodies. Those engaging in discrimination can include health-care workers, employers, schools, housing authorities and insurance companies. Such discriminatory acts include mandatory testing, segregating or detaining HIV-positive people, revealing without consent a person's HIV status and refusing a person entry into a country on the basis solely of their HIV status.

Such measures are often justified as necessary to achieve public-health goals or protect the rights and freedoms of others. Public-health measures such as case identification, isolation and treatment, however, should not be applicable to HIV/AIDS. They do not achieve the goals sought, and there is thus no public-health justification for them because HIV is not transmitted through ordinary, casual contact, and is not — unlike, for instance, tuberculosis — curable. Rather than prevent the transmission of HIV infection, coercive measures tend to drive people away from HIV prevention information and services.

In many places, people living with HIV and AIDS have started up peer groups of people living with HIV, or joined existing ones. Often these groups have arisen in the first place partly as a reaction against existing discrimination, so that one of their functions is lobbying to combat discrimination and stigmatization. These groups offer members mutual emotional, psychological and physical support. They provide a forum for exchange of information, including on therapies. In some places, buyers' clubs have been started among people living with HIV, to search for and buy needed therapies — often in other countries where they may be more accessible or affordable.

While most such groups are local, some operate at national or regional level. In recent years, the number of networks of people living with HIV and AIDS has grown rapidly and the range encompassed extends from global to national and local ones.

11. *Community mobilization*

Community mobilization — often initiated by people themselves infected with or affected by HIV — has from the start played a major role in the global response to AIDS. In many countries, community response came before the official national response. One of the best-known examples of this is The AIDS Support Organization (TASO) in Uganda. It was begun informally in 1987, when people infected with HIV, or affected by HIV in their family, started to meet in one another's homes. Their purpose was to comfort each other, to escape the stigma and rejection many had suffered, to share information and to give practical help such as transportation to medical appointments. As increasing numbers of people joined, TASO received outside financial and logistic support to train counsellors and organize a home-based prevention and care programme. TASO now has a staff of 150 and almost 2,000 volunteers, though it retains its founding principle — the involvement and full participation of infected and affected people in formulating policy and programmes and delivering services.

The community response has proved essential to many components — including awareness, prevention, impact alleviation, legal changes, advocacy and community care and support — of a successful national response.

In the past, community mobilization generally meant initiatives at a neighbourhood or local district level. Today, however, the AIDS pandemic and modern communications technology have changed traditional ideas of community, and national and even global communities have emerged with shared concerns with respect to preventing HIV transmission and care for those affected by the virus.

12. *Multisectoral national strategic planning*

There is sufficient proof worldwide that transmission rates of HIV can be reduced and the onset of AIDS-related conditions delayed significantly if well-designed programmes are undertaken and sustained for longer periods. However, the global response to the pandemic has not taken full advantage of accumulated knowledge. There are insufficient partnerships and coordination between those involved in the response, and not enough people and groups are being involved. Furthermore, programmes that are working are often not being replicated on a large enough scale.

Current initiatives have tended to focus on immediate prevention needs, but for those most affected they are generally inadequate. The initiatives have not embarked on coherent strategies towards providing HIV and AIDS care and social support and on alleviating the impact. They have also failed to address the socio-economic and cultural root causes of the epidemic.

Actions that in the longer term can help reduce vulnerability to HIV include effecting cultural changes, particularly with regard to the status of women, narrowing economic disparities through poverty alleviation programmes, and strengthening the capacity of health systems to cope with the demands of HIV and AIDS.

The fact that HIV infection impinges on so many different aspects of human society calls for a model covering a wide range of sectors as the basis for analysis and action. Such a model will include a set of persuasive approaches, individually oriented, for changing risk behaviour; enabling approaches more oriented towards social factors encouraging safer behaviour; and the inclusion of a range of sectors of society (not specifically related to health) that can contribute to the overall response.

13. *Conclusion*

As some parts of the world are approaching 20 years of facing the impact of the pandemic, there has been an increasing normalization of issues relating to HIV and AIDS. In some countries, this normalization has taken the form of treating HIV like any other communicable disease. In others, there has been an expansion and redefinition of sexual and reproductive health services so as to meet sexual health needs more effectively. Whatever form this normalization has taken, the challenge is to retain an HIV-specific focus amid the sea of other issues and concerns. The integration of HIV-related services into other forms of provision thus needs to be undertaken openly and in full consultation with the affected groups and communities, and in a manner that is mindful of the benefits that integration can sometimes bring, yet aware of the distinctiveness of the epidemic and of its impact on some of the most marginalized groups and communities.

Notes

[1]Individuals who have a deletion in one chromosome of Δ32 nucleotides in the chemokine receptor/gene CCR5 are said to be heterozygous for Δ32; those who have such a deletion in both chromosomes are homozygous for Δ32. About 10 per cent of the population of Northern America and Western Europe are Δ32 heterozygous, while about 1 per cent are homozygous. It appears that Δ32 homozygy in an individual confers resistance to most strains of HIV-1. At the same time, those who are simply Δ32 heterozygous — while they can become infected — seem to be slow progressors to disease. Other genetic factors, not presently well known, may also affect susceptibility to HIV. A recent study (Smith and others, 1997) suggests that those who not only are Δ32 heterozygous for CCR5, but also carry another mutated chemokine-HIV receptor/gene (CCR2), may be even slower progressors (by 2-4 years) to disease. According to the study, this mutation of CCR2 explains 25 per cent of all long-term nonprogressors.

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VI. THE EPIDEMIOLOGICAL TRANSITION

The epidemiological transition, the shift from the predominance of infectious and parasitic diseases to that of chronic and degenerative diseases of adulthood as the main causes of death, is now under way in all regions of the world. Already by mid-century, non-communicable diseases, most notably circulatory diseases and cancer, had replaced infectious diseases as the most prevalent causes of death in developed countries. By the early 1990s, close to 90 per cent of all deaths in these areas were due to non-communicable diseases.

Chronic and degenerative diseases are also emerging as being responsible for an increasing proportion of all deaths in developing countries. As global child survival strategies have succeeded in reducing infant and child mortality from communicable diseases, the cause-of-death profiles in developing countries are changing. Decline in fertility in turn has led to a shift in the population age structure towards an older population, which has also contributed to the increase in the proportion of all deaths due to chronic and degenerative diseases of adulthood, even as adult death rates have continued to decline. A larger proportion of the population is simply dying at adult ages, where non-communicable diseases dominate the cause-of-death structure. The extent to which these changes have occurred varies, however, within the developing world, and several recent studies have drawn attention to these changing epidemiological profiles (Feachem and others, eds., 1992; Jamison and others, eds., 1993; Gribble and Preston, 1993; World Bank, 1993; Murray and Lopez, 1996a and 1996b).

The present chapter begins by briefly discussing data availability for the study of worldwide mortality trends and the epidemiological transition, and the sources of data from which estimates presented in this chapter have been derived. It then reviews levels and trends in life expectancy, infant and child mortality, and the ageing of populations, factors closely associated with the epidemiological transition. Next, the chapter turns to a discussion of worldwide cause-of-death patterns, then offers concluding comments.

A DATA AVAILABILITY

As noted in chapter II, death registration coverage is reported to be virtually complete for only about 25 per cent of the world's population. The countries included in this category are the industrialized economies of Europe, Northern America, Japan, Australia and New Zealand, and a number of Latin American, Caribbean and some East-Asian countries. In contrast, civil registration systems are inadequate for virtually all countries in sub-Saharan Africa and most countries in Asia. Some countries, such as China and India, have established sample registration systems for selected areas (Murray, Yang and Qiao, 1992; Murray and Lopez, 1996a, pp. 117-200).

In the absence of civil registration data, mortality must be estimated from alternative sources. Such estimates are most reliably made for infant and child mortality. Data from the World Fertility Survey programme and subsequently from Demographic and Health Surveys have made empirical estimates of infant and child mortality possible in much of the developing world. Census-based techniques using information on children ever born and on surviving children provide an additional basis for estimating child mortality (Hill, 1991). Demographers have also developed a number of indirect estimation techniques using data from surveys and censuses for the estimation of adult mortality (Timaeus, 1991). The main drawback of these estimates is that they are often not available for the most recent past, particularly in the case of adult mortality.

These alternative approaches have enabled analysts to estimate mortality for many developing countries without reliable civil registration systems. As a last resort, mortality estimates are made with the aid of model life-tables, which frequently combine estimates of child mortality with model-based estimates of adult mortality (Murray, Yang and Qiao, 1992). Using a combination of these methods and data sources, the Population Division of the United Nations Secretariat and the World Bank have prepared periodic country-specific and regional mortality estimates covering the entire world. Where such estimates are not empirically based, they can vary substantially, particularly at adult ages, depending on the agency preparing the estimates (Murray and Lopez, 1997a). Estimates of life expectancy, infant and child mortality, and the age distribution of deaths cited in this chapter are based primarily on estimates prepared by the Population Division of the United Nations Secretariat (United Nations, 1998).

Accurate estimates of cause-specific mortality require not only complete data on deaths but also medically certified and reliably recorded causes of death. Thus, far less is known about worldwide patterns of underlying causes of death than about the age pattern of mortality. Cause-specific mortality data from civil registration systems are typically available only for developed countries, some parts of Latin America, and Eastern Asia. Causes of death are coded according to the International Classification of Diseases (ICD) permitting comparisons across countries (World Health Organization, 1978). Inconsistencies among countries in diagnostic and coding practices can affect such comparisons however, particularly for detailed causes of death (Murray and Lopez, 1996a, pp. 117-200).

Sample registration systems, such as those in China and India, also provide some cause-specific information for populations covered by these systems. Other sources of cause-specific mortality data include epidemiological studies, hospital-based data-collection systems and special population centres, such as the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDRB) in Matlab, Bangladesh. In addition, model-based estimates of cause-of-death patterns have been developed where the level of mortality for a broad group of causes is predicted from an overall level of mortality, in some cases by age group (Preston, 1976; Hakulinen and others, 1986; Bulatao, 1993). All of the above data sources in combination with model-based estimates have been used to provide estimates of cause-of-death patterns for the entire world and by region (Lopez, 1993; Murray, Yang, and Qiao, 1992; World Health Organization, 1997).

The most comprehensive effort undertaken to provide estimates of cause-specific mortality and disability by age and sex for eight geographical regions is the Global Burden of Disease Study (Murray and Lopez, 1996a; 1996b; 1997a; 1997b; 1997c; 1997d). This five-year effort, initiated in 1992, had four specific objectives: "to develop internally consistent estimates of mortality for 107 causes of death by age, sex, and geographic region; to develop internally consistent estimates of incidence, prevalence, duration, and case-fatality for 483 disabling sequelae of the 107 causes; to estimate the fraction of mortality and disability attributable to ten major risk factors; (and) to develop various projection scenarios of mortality and disability estimates by cause, age, sex and region" (Murray and Lopez, 1997a, p. 1,269). Special steps were taken to make cause-specific mortality data as consistent as possible across regions. In addition, experts were consulted for the estimation of disease-specific disability measures, and attention was paid to internal consistency. The final results were presented in the form of several demographic measures, including life expectancy, probabilities of dying in various age intervals, years of life lost because of premature death, years of life lived with disability, and disability-adjusted life years (DALYs). Epidemiological indicators in turn include incidence and prevalence rates of various diseases and disabilities (Murray and Lopez, 1996a; 1996b).

The cause-of-death data, which are of primary interest in this chapter, were initially classified according to three broad cause groups, each of which was subsequently divided into sub-groups with further division into specific causes of death. Group 1 causes consist of communicable diseases and maternal, perinatal and nutritional disorders. Group 2 causes are made up of 14 broad categories of non-communicable diseases, such as malignant neoplasms, diabetes mellitus, neuropsychiatric conditions, cardiovascular diseases and respiratory diseases. Groups 3 causes in turn consist of intentional and unintentional injuries and accidents. Typically, as mortality declines and the epidemiological transition progresses, Group 1 causes diminish in importance while deaths from non-communicable diseases begin to grow as a proportion of all deaths.

Table 32 shows the sources of cause-specific mortality data used in this study. As noted above, cause-specific data from civil registration systems are virtually complete only for established market economies and former socialist economies of Europe. At the other extreme are countries in sub-Saharan Africa where civil registration data are virtually non-existent. To make up for the gaps in civil registration coverage, the authors rely on data from sample registration systems for China and India, and data from population laboratories, epidemiological studies and cause-of-death models, when no alternative source is available (Murray and Lopez, 1996a, pp. 117-200).

TABLE 32. SOURCES USED TO ESTIMATE MORTALITY BY CAUSE FOR EIGHT REGIONS OR COUNTRY GROUPS IN 1990: THE GLOBAL BURDEN OF DISEASE STUDY

	Civil registration (percentage coverage)			*Sample registration*[a]	
Region or country group	*Under 5 years*	*Five years and over*	*Total*	*Urban*	*Rural*
Established market economies.....	99	99	99		
Former socialist economies.....	99	99	99		
India.....				ICD	SCD(R)
China.....				DSP	DSP
Other Asia and Pacific islands.....	2.1	13.6	10.2		
Sub-Saharan Africa.....	0.4	1.7	1.1		
Latin America and the Caribbean.	27.6	47.2	42.6		
Northern Africa, South-central and Western Asia.....	12.3	27.1	21.8		

Source: C. J. L. Murray and A. D. Lopez, eds., *Global Burden of Disease: A Comprehensive Assessment of Mortality and Disability from Diseases, Injuries, and Risk Factors in 1990 and Projected to 2020* (Cambridge, Massachusetts, Harvard School of Public Health on behalf of World Health Organization and World Bank, 1996), table 3.7.

[a]ICD=ICD-9 coded medically certified hospital deaths in Maharashtra State; SCD(R)=Survey of Causes of Death (Rural); DSP=Disease Surveillance Point System.

TABLE 33. LIFE EXPECTANCY AT BIRTH, BOTH SEXES, WORLD, MORE DEVELOPED AND LESS DEVELOPED REGIONS, AND LEAST DEVELOPED COUNTRIES, 1950-1995

	World		More developed regions[a]		Less developed regions[b]		Least developed countries	
Period	Life expectancy at birth (years)	Change[c]	Life expectancy at birth (years)	Change[c]	Life expectancy at birth (years)	Change[c]	Life expectancy at birth (years)	Change[c]
1950-1955	46.5	n.a.	66.5	n.a.	40.9	n.a	35.5	n.a
1955-1960	49.6	3.1	68.5	2.0	44.4	3.5	37.7	2.2
1960-1965	52.3	2.7	69.8	1.3	47.7	3.3	39.6	1.9
1965-1970	56.0	3.7	70.5	0.7	52.2	4.5	41.8	2.2
1970-1975	57.9	1.9	71.2	0.7	54.7	2.5	43.6	1.8
1975-1980	59.7	1.8	72.2	1.0	56.7	2.0	45.2	1.6
1980-1985	61.3	1.6	73.0	0.8	58.6	1.9	47.1	1.9
1985-1990	63.1	1.8	74.0	1.0	60.6	2.0	49.3	2.2
1990-1995	64.3	1.2	74.2	0.2	62.1	1.5	49.7	0.4

Source: *World Population Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.XIII.5), *Annex I*: Demographic indicators, table A.26.

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

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

[c]Refering to the absolute change in life expectancy from the previous to the current period.

B. TRENDS AND REGIONAL VARIATION IN MORTALITY

The rapid mortality decline during the second half of the twentieth century throughout the world is by now well established. It is estimated that between 1950-1955 and 1990-1995 life expectancy at birth rose by nearly 18 years from 46.5 years to 64.3 years in the world as a whole, while the gap in life expectancy between more developed and less developed regions narrowed from estimated 25.6 years to 12.1 years (table 33). At the same time, the slower pace of improvement in least developed countries relative to other developing countries led to a greater disparity in mortality among developing nations over time. Life expectancy at birth rose by only 14.2 years in least developed countries compared with an estimated gain of 21.2 years in developing countries as a whole between 1950-1955 and 1990-1995. Improvements in living standards due to social and economic development, modern health technology, cultural and behavioural factors, and actions of national and local governments all undoubtedly contributed to the observed trends, with the relative importance of each varying from place to place (Preston, 1980 and 1985; Hill and Pebley, 1989; Caldwell, 1990 and 1993; Murray and Chen, 1993).

Diversity in the level of mortality among less developed regions is clearly evident in table 34 which presents life expectancy at birth and infant and child mortality by region for 1990-1995. Among developing countries, those located in Eastern, Middle, and Western Africa had the lowest estimated life expectancy in 1990-1995, with estimates ranging from 46.7 years in Eastern Africa to 51.0 years in Middle Africa. In contrast, regional estimates for Latin America and the Caribbean, and Eastern Asia place average life expectancies in these areas above or only slightly below the estimate for Eastern Europe. Estimates for Northern and Southern Africa, and for the rest of Asia fall in between.

An important factor in gains in life expectancy in developing countries has been the steady decline in child mortality from childhood infectious diseases in recent decades. Although all less developed regions have experienced declines in child mortality, the rates of decline appear to have been slower in sub-Saharan Africa than in Northern Africa, Latin America or Asia (Hill and Pebley, 1989; Hill, 1995; chap. III of this report). Within regions, progress has also not been uniform. Available estimates for selected countries in sub-Saharan Africa in 1990, for example, show levels of under-five mortality ranging from over 200 per 1,000 in Guinea (254), Malawi (234) and Burkina Faso (204) to a low of 59 in Botswana. Large disparities in child mortality have also been recorded in Latin America and Asia (see chap. III).

Far less is known about levels and trends in adult mortality than in child mortality in developing countries. One study provides a rough estimate of the decline in adult mortality in developing countries (the probability of dying between ages 15 and 60 per 1,000 persons reaching age 15) from about 450 in 1950 to about 230 in 1990 (World Bank, 1993, chap. 1, sect. entitled "Mortality transitions since 1950"). Studies that have examined country-specific variation in

TABLE 34. LIFE EXPECTANCY, INFANT MORTALITY AND PROBABILITY OF DYING BY AGE 5 (PER 1,000 LIVE BIRTHS), 1990-1995

Region	*Life expectancy at birth (years)*	*Infant mortality (per 1,000)*	*Probability of dying by age 5*
World	64.3	62	82
More developed regions	74.2	11	13
Less developed regions	62.1	68	90
Least developed countries	49.7	109	156
Africa	51.8	94	145
Eastern Africa	46.7	108	164
Middle Africa	51.0	97	149
Northern Africa	62.1	67	86
Southern Africa	62.1	55	87
Western Africa	49.5	98	164
Asia	64.5	62	77
Eastern Asia	69.7	41	44
South-central Asia	60.4	78	102
South-eastern Asia	63.7	54	70
Western Asia	66.3	60	75
Europe	72.7	13	16
Eastern Europe	68.2	19	23
Northern Europe	75.8	7	9
Southern Europe	76.0	11	15
Western Europe	76.7	7	8
Latin America and the Caribbean	68.5	40	46
Caribbean	68.5	43	55
Central America	70.5	37	46
South America	67.8	41	45
Northern America	76.2	9	10
Oceania	72.9	26	33
Australia-New Zealand	77.4	7	9

Source: *World Population Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.XIII.5).

adult mortality show similar variation among developing countries in the level of adult mortality as in that estimated for child mortality. Relying on data from a variety of sources and various indirect estimation techniques, Timaeus (1993), for example, estimates the average level of adult mortality in sub-Saharan Africa to be high relative to the rest of the world. Similarly, Murray, Yang and Qiao (1992) show considerable variation in the level of adult mortality among developing countries for which adult mortality can be estimated from civil registration data.

Concomitant with changes in mortality, declining fertility has led to the ageing of the developing world population, which in turn has contributed to an increase in the proportion of deaths from chronic and degenerative diseases of adulthood, even as mortality in adulthood has continued to decline. As these populations continue to age, the burden of non-communicable diseases will continue to grow. The proportion of the population aged 65 years or over in less developed regions is estimated to increase from 4.7 per cent in 1995 to 5.6 per cent by 2010, and to 9.4 per cent by 2030, an estimated increase of some 461 million people. It is estimated that, already in 1995, over 50 per cent of the world's elderly (those aged 65 years or over) lived in developing countries, a proportion that it is estimated will increase to over 70 per cent by 2030 (United Nations, 1998; World Bank, 1993).[1]

At present, these trends are most visible in Latin America and in Eastern Asian countries, but are also becoming evident elsewhere. In 1990-1995, it is estimated that 65 per

cent of all deaths in less developed regions occurred at ages 15 and above, with 33 per cent of all deaths to individuals who were 65 years or over. Regional variations in the age distribution of deaths is shown in annex table A.17. Only in some regions of Africa are over half of all deaths estimated to have occurred among individuals under age 15 in 1990-1995 with the lowest proportions among less developed regions found in Eastern Asia and Latin America. These regional variations are reflected in the current epidemiological profiles in the less developed regions discussed in section C below.

In the more developed regions, by the 1950s chronic and degenerative diseases of adulthood had replaced infectious diseases as the main causes of death. Life expectancy at birth at the time was comparable with that estimated for less developed regions in the early 1990s (table 33). Despite some skepticism about the prospects of future mortality decline in developed countries at the time, mortality has continued its downward trend in most countries (Preston, 1996). The major exceptions are former socialist economies of Eastern Europe and the former Soviet Union. Until about the mid-1960s, life expectancies at birth were rather comparable in the industrialized countries of Western and Eastern Europe. Since then, however, while mortality in Western Europe has continued on its downward course, mortality improvements in Eastern European countries and the former Soviet Union have stagnated and, in some instances, as in the Russian Federation, mortality has increased in the most recent past (Bourgeois-Pichat, 1984; World Health Organization, 1995a; Bobak and Marmot, 1996; Leon and others, 1997).

Mortality trends in Eastern Europe have been particularly adverse among middle-aged males, while mortality among women and children has typically continued to decline although less so than in Western Europe (Watson, 1995). This divergence has led to differences in life expectancies of over 10 years between the lowest- mortality Western European countries and the worst performers in Eastern Europe among both sexes. Overall, in 1992 there was about a six-year difference in life expectancy between Eastern European countries and the rest of Europe. Mortality differentials in the age range 35-64 alone contributed close to half (43 per cent) of this gap. Cardiovascular diseases (54 per cent), external causes (23 per cent), and respiratory diseases (16 per cent) accounted for over 90 per cent of the six-year difference in life expectancy (Bobak and Marmot, 1996, pp. 421-422). Analysts have typically attributed these differentials to behavioural, lifestyle and environmental factors and medical care, with psychosocial factors being added to the list more recently (Makara, 1994; Watson, 1995; Bobak and Marmot, 1996; Cockerham, 1997; Velkova, Wolleswinkel-Van Den Bosch and Mackenbach, 1997).

Except for a brief period of stagnation in the decline in male mortality in the 1960s, mortality at all ages in Western Europe, the United States of America, and most notably Japan has continued to decline. In all countries infant mortality is below 10 per 1,000, and the vast majority of deaths are recorded to individuals aged 65 years or over, with half of female deaths and a third of male deaths occurring after age 80 (chaps. II and III of this report; Kannisto and others, 1994). Among the causes of death whose change in status has contributed to the mortality decline, cardiovascular diseases stand out as particularly important (Uemura and Pisa, 1988; Olshansky and Ault, 1986). Clearly any future gains in life expectancy will depend to a large extent on what happens to chronic disease mortality at the oldest ages.

As the above discussion suggests, the demographic and epidemiological transitions have progressed at different pace in various parts of the world. Some developing countries and regions have experienced relatively rapid declines in mortality and ageing of their populations, while in others these changes have been more gradual. Such trends have led to a growing diversity in the epidemiological profiles among developing countries and regions. In developed countries, although chronic and degenerative diseases of adulthood have dominated the cause-of-death profiles since mid-century, considerable variation in the course of mortality decline from such diseases is also evident, particularly between Eastern Europe and other industrialized countries.

C. Causes of death

The World Health Organization (WHO) has published the most recent worldwide estimates of deaths by cause for the more developed and the less developed regions (World Health Organization, 1997). Table 35 presents these estimates for seven broad cause-of-death groups for the world, and developed and developing countries. They show that chronic and degenerative diseases of adulthood are now the most prevalent causes of death in the world as a whole. According to these estimates, malignant neoplasms and diseases of the circulatory and respiratory systems accounted for close to half (47 per cent) of the approximately 52 million estimated deaths worldwide in 1996. Among the major chronic diseases, diseases of the circulatory system predominated. Deaths from infectious and parasitic diseases, in turn, made up about a third (33 per cent) of the estimated total, with the remaining 20 per cent being attributed to perinatal, neonatal, maternal and other and unknown causes.

In developed countries, the three major chronic disease groups accounted for about three quarters of all estimated deaths, reflecting the virtual completion of the epidemiological transition in these areas. In fact, WHO estimates that almost all deaths from infectious and parasitic diseases, maternal, perinatal and neonatal causes worldwide now occur in developing countries, where they were estimated to account for approximately 54 per cent of all deaths in 1996. At the same time, however, chronic and degenerative diseases of adulthood have also emerged as increasingly important. WHO attributed well over a third of all developing-country deaths (39 per cent) in 1996 to the three major chronic disease groups identified in table 35.

Over 98 per cent of all deaths worldwide at ages 0-4 occur in developing countries. Despite progress in reducing mortality from childhood infectious diseases in the last decades, causes for which relatively inexpensive interventions are available continue to take a heavy toll (table 36). WHO estimates that 2.1 million (19 per cent) of the estimated 11.2 million total deaths under age 5 were due to vaccine-pre-

TABLE 35. CAUSES OF DEATH IN THE WORLD AND DEVELOPED AND DEVELOPING COUNTRIES, 1996

Cause of death	World		Developed countries		Developing countries		Percentage in developing countries
	Number (thousands)	Percentage	Number (thousands)	Percentage	Number (thousands)	Percentage	
Infectious and parasitic diseases	17 312	33.3	151	1.2	17 161	43	99.1
Diseases of circulatory system	15 300	29.4	5 522	45.6	9 778	24.5	63.9
Malignant neoplasms	6 346	12.2	2 544	21.0	3 802	9.5	59.9
Diseases of respiratory system	2 888	5.5	979	8.1	1 909	4.8	66.1
Perinatal and neonatal causes	3 745	7.2	119	1.0	3 626	9.1	96.8
Maternal causes	585	1.1	3	0.02	582	1.5	99.5
Other and unknown	5 861	11.3	2 798	23.1	3 063	7.7	52.3
Total	52 037	100.0	12 116	100.0	39 921	100.0	76.7

Source: World Health Organization, *The World Health Report, 1997* (Geneva, 1997), pp. 20-21.

ventable causes in 1995.[2] The two most important causes of death among children — diarrhoeal diseases and acute lower respiratory tract infections — accounted for 3.6 million estimated deaths in 1995, or 32 per cent of the total. These causes have proved to be particularly intractable under conditions of severe deprivation (Preston, 1980). WHO attributes the remaining 5.5 million deaths to neonatal and perinatal causes.

As noted previously, the extent to which the demographic and epidemiological transitions have progressed in the developing world vary by regions and countries within regions. While the above estimates for the world and more developed and less developed regions draw attention to important differences between these areas, they also hide important variability. To examine the epidemiological transition by regions, estimates prepared for the Global Burden of Disease study (GBD) are reviewed. Before proceeding, however, it should be noted that the WHO estimates of cause-of-death patterns for developed and developing countries for 1996, discussed above, differ somewhat from those estimated by the GBD for 1990. The differences in the two sets of estimates are due to methodological differences in how they were derived, and underscore the difficulty in estimating worldwide cause-of-death patterns in the absence of reliable registration data for much of the world's population. Both sets of estimates nevertheless point to the growing importance of non-communicable diseases in the developing world as a whole. Any differences between the two sets of estimates should not detract from their major findings. The results of the Global Burden of Disease study are discussed below.

Cause-of-death profiles are presented below for eight areas and country groups used in the GBD. They include (*a*) established market economies, consisting of high-income countries; (*b*) formerly socialist economies of Europe, including the Russian Federation; (*c*) India; (*d*) China; (*e*) Northern Africa, South-central and Western Asia and Malta;[3] (*f*) other Asia and the Pacific Islands;[4] (*g*) Latin America and the Caribbean; and (*h*) sub-Saharan Africa. In addition, summary data are included for developed regions, which consist of established market economies and former socialist economies of Europe; for developing regions, which include rest of the world; and for the world as a whole. Although country-specific variation in epidemiological profiles is also likely to be substantial, country-specific analyses are beyond the scope of this chapter.

The quality of estimates discussed below varies by region. Estimates are most reliable for the two developed regions because civil registration data are virtually complete for these areas. On the other hand, estimates are least reliable for sub-Saharan Africa, particularly with respect to specific chronic diseases of adulthood. Virtually no representative data on cause-of-death distributions among adults are available for this region. The quality of the estimates for the other regions fall in between these two extremes (see table 32).

Figure 17 presents the age distribution of deaths by region or country group, developed and developing countries, and the world as a whole, and illustrates the variability in the extent to which the demographic transition has taken place among the areas considered here. Where the transition is most advanced, that is to say, in established market economies and

TABLE 36. MAIN CAUSES OF DEATH AMONG CHILDREN UNDER AGE 5, DEVELOPING WORLD, 1995

Cause of death	*Number (millions)*	*Percentage of total*
Diarrhoea, excluding neonatal diarrhoea	2.1	18.8
Acute lower respiratory tract infections, excluding neonatal pneumonia	1.5	13.4
Other neo- and perinatal causes	1.1	9.8
Prematurity	1.1	9.8
Measles	1.1	9.8
Birth asphyxia	0.9	8.0
Congenital anomalies	0.5	4.5
Neonatal tetanus	0.5	4.5
Birth trauma	0.4	3.6
Neonatal sepsis and meningitis	0.4	3.6
Pertussis	0.4	3.6
Tuberculosis	0.1	0.9
Other	1.1	9.8
TOTAL	11.2	

Source: World Health Organization, *The World Health Report, 1997* (Geneva, 1997), p. 21.

the former socialist economies of Europe, the majority of deaths were at ages 70 and above in 1990, the proportions being 66 per cent and 51 per cent respectively. In contrast, in the developing regions, the proportion of deaths in the oldest age group ranged from about 10 per cent in sub-Saharan Africa to 41 per cent in China. Twenty-four per cent of all developing- country deaths were at the oldest ages. Despite the much higher proportion of all deaths in the oldest age group in the two developed regions, over half of all deaths (59 per cent) in this age range were in developing countries, with China alone accounting for about 23 per cent of the total.

At the other age extreme, 98 per cent of all deaths at ages 0-4 were in developing countries. Again, however, there was considerable variability in the percentage of deaths in this age range among regions, reflecting differences in the overall age distributions and levels of child mortality. Close to half of all deaths in sub-Saharan Africa, for example, fell into this age range, while in China only 12 per cent of all deaths were at ages 0-4. Overall, 32 per cent of developing-country deaths were in this youngest age group (Murray and Lopez, 1996a, pp. 117-200; Murray and Lopez, 1997a).

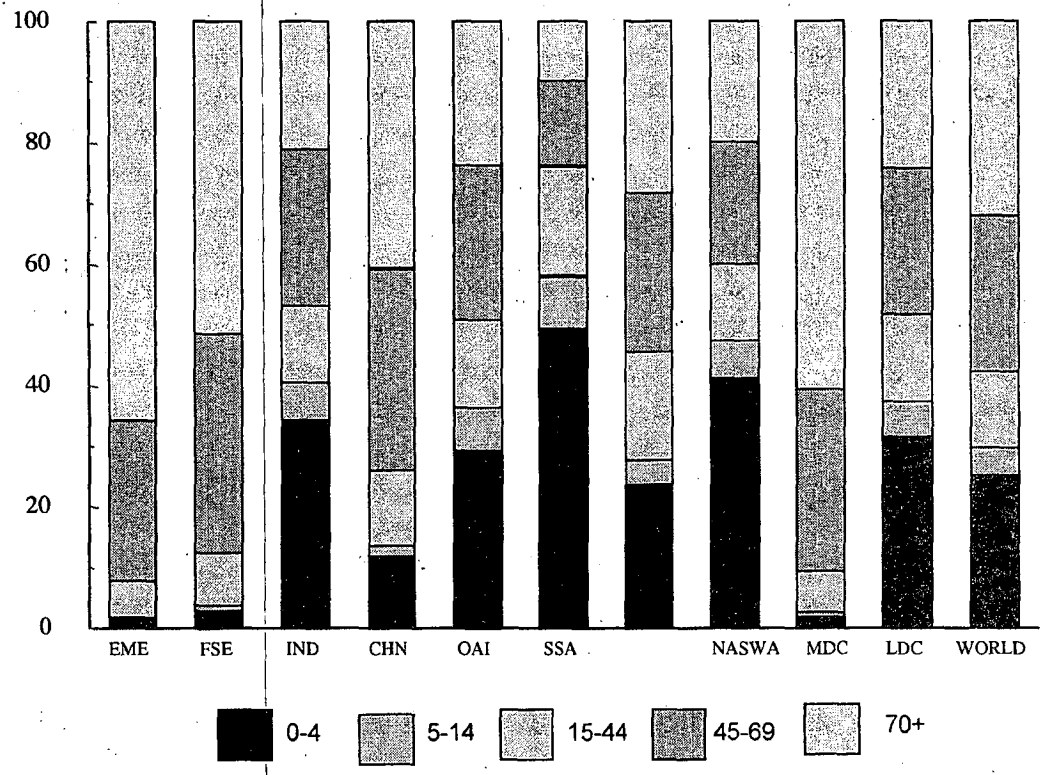
Figure 18 shows the proportion of deaths by three major cause groups — communicable diseases, including maternal, perinatal and nutritional conditions;[5] non-communicable diseases; and injuries — by region, developed and developing countries, and the world as a whole. The differences in the age distribution of deaths by region, discussed above, were reflective of the extent to which the epidemiological transition in each region had progressed. As figure 18 illustrates, the transition is virtually complete in the two developed regions, where well over 80 per cent of all deaths are attributable to non-communicable diseases. It is also well under way in China, where 73 per cent of all deaths are due to such causes. In Latin America and the Caribbean, non-communicable diseases also made up over half of all deaths (56 per cent), while communicable diseases accounted for about a third of the total. Similarly in Northern Africa, and South-central and Western Asia and the area consisting of other Asia and Pacific Islands, non-communicable diseases made up a larger share of all deaths than did communicable diseases, 47 per cent versus 43 per cent and 50 per cent versus 40 per cent respectively. Of the estimated 28.1 million non-communicable disease deaths, 67 per cent were estimated to have occurred in developing countries.

Deaths from communicable diseases made up over half of all deaths only in India (51 per cent) and sub-Saharan Africa (65 per cent). Of the 17.2 million communicable disease deaths, 96 per cent were estimated to have occurred in developing countries. The proportion of deaths due to injuries also varied by region from a low of 6 per cent of all deaths in established market economies to a high of 12-13 per cent in Latin America and the Caribbean and sub-Saharan Africa (Murray and Lopez, 1996a, pp. 117-200; 1997a). Eighty-four per cent of the 5.1 million injury deaths worldwide were in developing countries.

The risk of dying from communicable and non-communicable diseases and injuries also varied by region, age, and sex (Murray and Lopez, 1997a). As expected, the highest death rate among children and young adults (aged 0-15) was in sub-Saharan Africa, followed by India, Northern Africa, South-central and Western Asia, other Asia and Pacific Islands, Latin America and the Caribbean, China, and the former socialist economies of Europe, with the lowest rates

Figure 17. Distribution of death by age and region or country group, 1990

(*Percentage*)



Source: C. J. L. Murray and A. D. Lopez, eds., *The Global Burden of Disease: A Comprehensive Assessment of Mortality and Disability from Diseases, Injuries, and Risk Factors in 1990 and Projected to 2020* (Cambridge, Massachusetts, Harvard School of Public Health on behalf of World Health Organization and World Bank, 1996), annex table 6.

NOTE: EME = established market economies; FSE = former socialist economies of Europe; IND = India; CHN = China; OAI = other Asia and the Pacific; SSA = sub-Saharan Africa; LAC = Latin America and the Caribbean; NASWA = Northern Africa, South-central and Western Asia; MDC = more developed countries; LDC = less developed countries.

in established market economies. These regional differentials were driven by variations in the level of mortality at the youngest ages (0-4) from communicable diseases. As noted above, such causes are most prevalent in the least developed regions, where they are concentrated in children under age 5. In sub-Saharan Africa, for example, 70 per cent of all deaths from communicable diseases were at ages 0-4, with diarrhoeal diseases, respiratory infections, malaria and perinatal conditions being the most important. In other developing regions, diarrhoeal diseases, respiratory infections and perinatal causes dominated mortality in childhood among both boys and girls, with the relative importance of each cause varying from place to place (Murray and Lopez, 1996a, pp. 117-200; Murray and Lopez, 1997a).

At ages 15-60, important sex differences in mortality were evident in 1990. Among women, the regional rankings in mortality were the same as for the youngest age group, but instead of their being driven by differentials in mortality from communicable diseases, variation in non-communicable disease mortality predominated. The risk of death was higher in developing than in developed regions from these causes (Murray and Lopez, 1997a). Among non-communicable diseases, mortality from malignant neoplasms and cardiovascular diseases were the most important causes of female deaths in this age group in all areas, although regional variation in the relative importance of the two was also evident. The ratio of female deaths from cardiovascular diseases to that from malignant neoplasms in the age range 15-60 ranged

from 2.91 in Northern Africa, South-central and Western Asia and 1.62 in sub-Saharan Africa to 0.47 in established market economies and 0.95 in former socialist economies of Europe. The most common form of cancer in the two developed regions among women in this age interval was breast cancer (Murray and Lopez, 1996a, pp. 117-200).

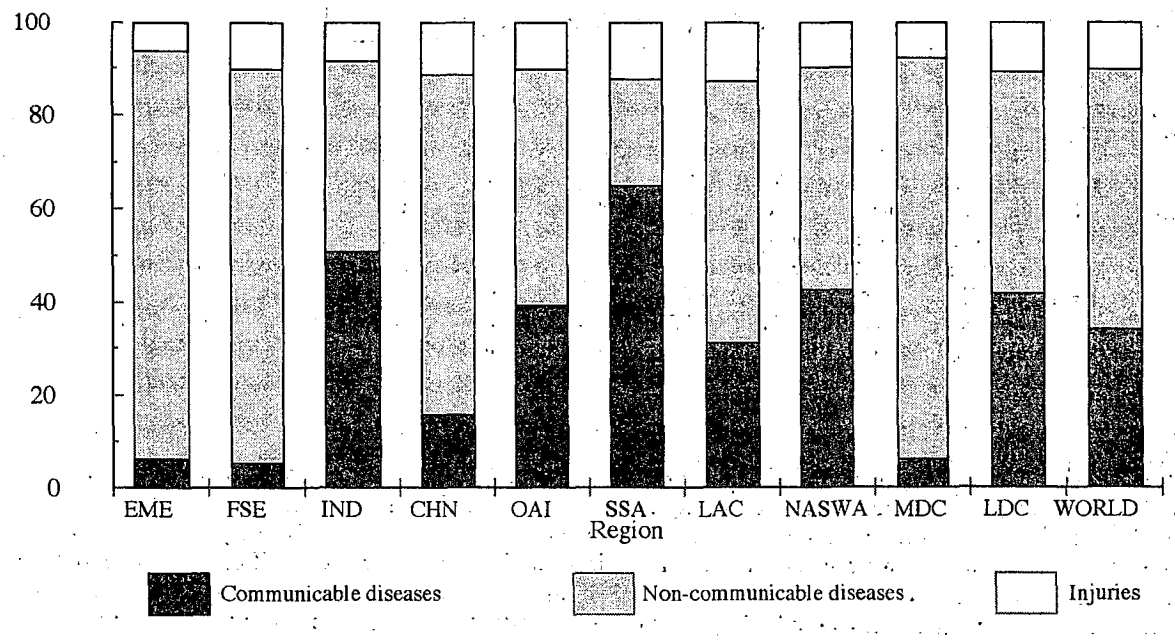
Only in sub-Saharan Africa was mortality from communicable diseases among women in this age range comparable with that from non-communicable diseases (Murray and Lopez, 1997a). The main causes of communicable disease mortality among women in sub-Saharan Africa were, in the order of importance, maternal conditions, tuberculosis and HIV (Murray and Lopez, 1996a, pp. 117-200; see also chaps. IV and V of this report). In addition to sub-Saharan Africa, India had high mortality from communicable diseases among young and middle-aged women compared with the rest of the world. The two most important contributing causes were maternal conditions and tuberculosis.

A somewhat different pattern in the risk of dying emerges among men at ages 15-60, which reflects the extremely high male mortality in Eastern Europe and the former Soviet Union noted previously. Murray and Lopez (1997a, p. 1,273) point out that in 1990 "formerly socialist economies of Europe had a higher probability of death (28.4 per cent) than any other region except sub-Saharan Africa (39.1 per cent)" in this age group. The high male mortality in former socialist economies of Europe was largely driven by the extremely high death rates from non-communicable diseases, particularly cardiovascular diseases. In addition, relatively high mortality from injuries, reflecting the second highest risk after sub-Saharan Africa, contributed to elevated male mortality in this region.

Among other regions, established market economies had the lowest mortality for young and middle-aged males, followed by China, Latin America and the Caribbean, Northern Africa and South-central and Western Asia, other Asia

Figure 18. Distribution of deaths by cause and region or country group, 1990

(Percentage)



Source: C. J. L. Murray and A. D. Lopez, eds., *The Global Burden of Disease: A Comprehensive Assessment of Mortality and Disability from Diseases, Injuries, and Risk Factors in 1990 and Projected to 2020* (Cambridge, Massachusetts, Harvard School of Public Health on behalf of World Health Organization and World Bank, 1996), annex tables 6-6i.

NOTE: EME = established market economies; FSE = former socialist economies of Europe; IND = India; CHN = China; OAI = other Asia and the Pacific; SSA = sub-Saharan Africa; LAC = Latin America and the Caribbean; NASWA = Northern Africa, South-central and Western Asia; MDC = more developed countries; LDC = less developed countries.

TABLE 37. DISTRIBUTION OF FEMALE DEATHS BY BROAD GROUPS OF CAUSES, 1990
(*Thousands*)

Cause of death	*EME*	*FSE*	*IND*	*CHN*	*OAI*	*SSA*	*LAC*	*NASWA*
All causes	3 462	1 883	4 496	4 056	2 490	3 878	1 355	2 154
Communicable diseases	216	105	2 356	697	1 029	2 645	432	964
Infectious and parasitic diseases	40	19	1 210	229	546	1 663	211	411
Respiratory infections	144	63	629	245	245	478	83	262
Maternal conditions	1	2	115	30	52	186	19	48
Perinatal conditions	19	14	334	144	147	245	81	194
Nutritional deficiencies	12	6	68	49	39	74	38	49
Non-communicable diseases	3 099	1 677	1 788	2 929	1 286	930	826	1 033
Malignant neoplasms	785	280	252	540	280	190	176	102
Other neoplasms	18	4	2	10	5	5	5	3
Diabetes mellitus	88	19	55	33	33	13	53	33
Endocrine diseases	26	2	1	9	5	13	14	9
Neuropsychiatric disorders	108	37	45	46	30	17	20	29
Sense-organ disorders	-	-	-	8	-	-	-	-
Cardiovascular diseases	1 684	1 186	1 100	1 246	667	471	394	637
Respiratory diseases	134	62	117	741	61	85	51	76
Digestive diseases	142	51	84	170	115	60	55	67
Genito-urinary diseases	64	19	44	50	50	44	26	39
Skin diseases	8	1	1	5	1	3	2	1
Musculoskeletal diseases	23	3	1	19	5	-	6	1
Congenital anomalies	18	12	85	54	34	28	22	37
Oral conditions	-	-	-	-	-	-	-	-
Injuries	147	101	352	430	175	303	97	156
Unintentional injuries	108	62	284	226	132	158	70	57
Intentional injuries	39	39	68	204	43	145	27	100

Source: C. J. L. Murray and A. D. Lopez, eds., *The Global Burden of Disease: A Comprehensive Assessment of Mortality and Disability from Diseases, Injuries, and Risk Factors in 1990 and Projected to 2020* (Cambridge, Massachusetts: Harvard School of Public Health on behalf of World Health Organization and World Bank, 1996), annex tables 6a-6h.

NOTE: A dash (-) indicates fewer than 500 deaths. *EME*=established market economies; *FSE*=former socialist economies of Europe; *IND*=India; *CHN*=China; *OAI*=other Asia and the Pacific; *SSA*=sub-Saharan Africa; *LAC*=Latin America and the Caribbean; *NASWA*=Northern Africa, South-central and Western Asia.

and Pacific islands and India (Murray and Lopez, 1997a). As for women, the most important causes among non-communicable diseases were malignant neoplasms and cardiovascular diseases. In all regions and country groups, except the established market economies and China, the ratio of deaths from cardiovascular diseases to those from malignant neoplasms was well above 1. In contrast, in established market economies and in China, the ratios were 0.98 and 0.73 respectively. Cancers of the trachea, bronchi and lung were the most common forms of cancer among males in established market economies, reflecting historical patterns of smoking in these areas. In China, the most common form of cancer in this age range was liver cancer.

In addition, mortality from communicable diseases among young and middle-aged males was higher in India and sub-Saharan Africa than in the other regions. In sub-Saharan Africa, the two main causes of male deaths were tuberculosis and HIV, while in India the most important cause of death

TABLE 38. DISTRIBUTION OF MALE DEATHS BY BROAD GROUPS OF CAUSES, 1990
(*Thousands*)

Cause of death	*EME*	*FSE*	*IND*	*CHN*	*OAI*	*SSA*	*LAC*	*NASWA*
All causes	3 659	1 908	4 875	4 829	3 044	4 324	1 654	2 399
Communicable diseases	237	109	2 418	708	1 161	2 671	511	980
Infectious and parasitic diseases	71	33	1 436	315	630	1 793	262	459
Respiratory infections	131	51	599	229	307	545	97	272
Maternal conditions	-	-	-	-	-	-	-	-
Perinatal conditions	27	22	326	133	184	258	115	201
Nutritional deficiencies	8	3	57	31	40	74	38	48
Non-communicable diseases	3 125	1 511	2 001	3 531	1 499	934	850	1 123
Malignant neoplasms	977	370	253	924	361	239	168	126
Other neoplasms	18	4	3	11	5	5	4	3
Diabetes mellitus	57	11	49	27	26	10	35	28
Endocrine diseases	21	2	1	5	4	10	13	8
Neuropsychiatric disorders	97	32	60	53	40	24	30	33
Sense-organ disorders	-	-	-	10	-	-	-	-
Cardiovascular diseases	1 491	885	1 165	1 322	681	344	395	658
Respiratory diseases	209	96	150	789	87	126	65	87
Digestive diseases	163	69	171	241	200	92	85	85
Genito-urinary diseases	58	25	60	73	48	52	27	53
Skin diseases	4	1	2	7	1	4	1	1
Musculoskeletal diseases	9	2	1	17	4	-	3	1
Congenital anomalies	21	15	85	51	40	26	21	39
Oral conditions	-	-	-	-	-	-	-	-
Injuries	298	288	456	590	384	718	293	296
Unintentional injuries	195	187	366	400	294	375	178	142
Intentional injuries	104	101	90	190	90	343	114	154

Source: C. J. L. Murray and A. D. Lopez, eds., *The Global Burden of Disease: A Comprehensive Assessment of Mortality and Disability from Diseases, Injuries, and Risk Factors in 1990 and Projected to 2020* (Cambridge, Massachusetts: Harvard School of Public Health on behalf of World Health Organization and World Bank, 1996), annex tables 6a-6h.

NOTE: A dash (-) indicates fewer than 500 deaths. *EME*=established market economies; *FSE*=former socialist economies of Europe; *IND*=India; *CHN*=China; *OAI*=other Asia and the Pacific; *SSA*=sub-Saharan Africa; *LAC*=Latin America and the Caribbean; *NASWA*=Northern Africa; South-central and Western Asia.

by far was tuberculosis. At ages 60-70, non-communicable diseases dominated both male and female mortality in all regions (Murray and Lopez, 1997a).

Tables 37 and 38 present the distribution of deaths by cause and region for females and males in 1990. Among communicable diseases, infectious and parasitic diseases were by far the most important causes of death in all regions for both sexes, except in established market economies, former socialist economies of Europe and China. In these regions, respiratory infections played a relatively more important role. As already noted, maternal conditions were also important in determining mortality rankings by region among reproductive-aged women (see also chap. IV).

Among non-communicable diseases, deaths from cardiovascular diseases and malignant neoplasms were the two most important cause groups in all regions among both men and women, with cardiovascular diseases being the more important of the two (tables 37 and 38). Worldwide, cardiovascular diseases caused approximately 7.4 million female deaths and about 6.9 million male deaths in 1990, 4.5 million of the female deaths and 4.6 million of the male cardiovascular disease-related deaths being in developing countries. Ischaemic heart disease was the leading cause of cardiovascular disease mortality, followed by cerebrovascular disease, in the world as a whole in 1990 (Murray and Lopez, 1997a).

Malignant neoplasms, in turn, were responsible for approximately 2.6 million female and 3.4 million male deaths in 1990. Of the 6 million cancer deaths, 3.6 million were in developing countries. Breast cancer was the most common form of cancer among women worldwide, followed by stomach cancer and by lung cancer. In developing regions, cancer of the cervix uteri also posed an important threat to women's health. It was the leading cause of cancer mortality among women in India, other Asia and Pacific Islands, and sub-Saharan Africa. Among men, lung cancer was by far the most important cause of cancer mortality. According to Murray and Lopez lung cancer caused almost twice as many male deaths in 1990 as cancer at the next most important site for men (the stomach) (Murray and Lopez, 1997a, p. 1,275). Other important cancer sites for males included the liver, oesophagus, colon and rectum, and prostate (Murray and Lopez, 1996a, pp. 117-200; Murray and Lopez, 1997a).

Deaths from injuries were much more common among men than women in all regions in 1990. Among women, the proportion of all deaths due to injuries ranged from 4 per cent in established market economies to 11 per cent in China (table 37). Almost half of all deaths from injuries among Chinese women were due to intentional causes, most important of which was suicide. Intentional injuries, with the largest proportion attributable to war, were responsible for over half of all injury deaths among women in Northern Africa, South-central and Western Asia, and close to half in sub-Saharan Africa. Among men, the proportion of all deaths due to injuries ranged from a low of 8 per cent in established market economies to a high of 18 per cent in Latin America and the Caribbean (table 38). The proportion of deaths from injuries due to intentional causes among men was highest in Northern Africa, South-central and Western Asia (52 per cent) and sub-Saharan Africa (48 per cent).

Table 39 presents the 10 leading causes of death by region in 1990. Considerable variation among regions is evident in these tabulations. As expected, non-communicable diseases were the most important causes of death in the two developed regions, namely, the established market economies and the former socialist economies of Europe. Of the communicable diseases, including maternal, perinatal and nutritional conditions, only lower respiratory infections appeared among the 10 leading causes of death in these areas. As noted earlier, one notable difference between the two developed regions related to mortality from accidents and injuries. In the former socialist economies of Europe, both road traffic accidents and self-inflicted injuries appeared among the 10 leading causes of death. In established market economies, only road traffic accidents appeared on this list.

In China, 7 out of the 10 leading causes of death were also non-communicable diseases, although the relative importance of specific causes differed from that in the two developed regions (table 39). Chronic obstructive pulmonary disease and cerebrovascular diseases were, for example, relatively more important in China than in the two developed regions. In addition to non-communicable diseases, lower respiratory infections, tuberculosis and self-inflicted injuries were among the 10 leading causes of death.

In the other regions, communicable diseases, including maternal, perinatal and nutritional conditions, were far more important. Of these causes, lower respiratory infections, diarrhoeal diseases, perinatal causes and tuberculosis in particular stood out. Communicable diseases were particularly important in India, sub-Saharan Africa, Northern Africa and South-central and Western Asia, where 7 of the 10 leading causes of death respectively belonged to this group of causes. In addition to lower respiratory infections, diarrhoeal diseases, perinatal causes and tuberculosis, measles and tetanus appeared among the 10 leading causes of death in India, Northern Africa and South-central and Western Asia, while in sub-Saharan Africa, malaria, measles, and HIV made the list. Of the non-communicable diseases, only ischaemic heart disease and cerebrovascular diseases were among the 10 leading causes of death in these three regions. In the remaining two regions, several communicable and non-communicable diseases appeared among the 10 leading causes of death in addition to injuries and accidents. In all regions, deaths from injuries appeared among the 10 leading causes of death. The types of injuries varied, however, by region. Road traffic accidents were among the 10 leading causes of death in 5 of the 8 regions, while in the other 3, intentional injuries were more prominent.

D. Conclusions

Since the start of the latter half of the twentieth century, remarkable progress has been made in reducing mortality throughout the world. Gains in life expectancies have been particularly rapid in many developing countries, and they are by now well known. What is perhaps less well appreciated is the growing diversity in the experience of developing countries. Although mortality has declined everywhere, reductions in child mortality and gains in life expectancies in many poor and least developed countries have lagged far behind those made elsewhere. In most developed countries, mortality has also continued to decline. The recent experience of Eastern European countries and the former Soviet Union suggests, however, that such declines are not inevitable.

Accompanying reductions in mortality, declining fertility has contributed to the ageing of the world's population. Over half of today's elderly are now living in developing countries. If current trends continue, it is estimated that by the year 2030, over two thirds of those aged 65 or over will be developing-country residents. These demographic changes have contributed to the worldwide increase in the burden of non-communicable diseases. By the early 1990s, non-communicable diseases were responsible for close to 60 per cent of all deaths worldwide. The proportion of deaths attributed to non-communicable diseases was by far the greatest in developed countries; but even when all developing countries are considered together, non-communicable diseases made up a larger proportion of all deaths than did communicable diseases. In addition, injury mortality made an important contribution to worldwide cause-of-death patterns.

Although non-communicable diseases have been the most important causes of death in developed countries since mid-century, the relative contributions of various causes to overall level of mortality vary from place to place and reflect the

TABLE 39. TEN LEADING CAUSES OF DEATH BY REGION OR COUNTRY GROUP, 1990

(*Thousands*)

Cause of death	*Number of deaths*
Established market economies	
1. Ischaemic heart disease	1 668
2. Cerebrovascular disease	788
3. Trachea, bronchus and lung cancer	379
4. Lower respiratory infections	272
5. Chronic obstructive pulmonary disease	245
6. Colon and rectum cancers	208
7. Stomach cancer	140
8. Breast cancer	134
9. Road traffic accidents	131
10. Cirrhosis of the liver	117
China	
1. Chronic obstructive pulmonary disease	1 432
2. Cerebrovascular disease	1 272
3. Ischaemic heart disease	762
4. Lower respiratory infections	467
5. Self-inflicted injuries	343
6. Stomach cancer	319
7. Liver cancer	293
8. Tuberculosis	278
9. Trachea, bronchus and lung cancer	218
10. Cirrhosis of the liver	187
India	
1. Lower respiratory infections	1 195
2. Ischaemic heart disease	1 175
3. Diarrhoeal diseases	922
4. Tuberculosis	752
5. Cerebrovascular disease	448
6. Low birth weight	333
7. Tetanus	212
8. Measles	206
9. Road traffic accidents	174
10. Birth asphyxia and birth trauma	169
Other Asia and Pacific islands	
1. Lower respiratory infections	543
2. Ischaemic heart disease	461
3. Diarrhoeal diseases	397
4. Cerebrovascular disease	390
5. Tuberculosis	320
6. Low birth weight	164
7. Road traffic accidents	133
8. Cirrhosis of the liver	131
9. Measles	113
10. Trachea, bronchus, lung cancer; nephritis and nephrosis; drownings	85
Former socialist economies of Europe	
1. Ischaemic heart disease	1 027
2. Cerebrovascular disease	639
3. Trachea, bronchus and lung cancer	144
4. Lower respiratory infections	113
5. Stomach cancer	101
6. Road traffic accidents	91
7. Self-inflicted injuries	81
8. Chronic obstructive pulmonary disease	80
9. Colon and rectum cancers	69
10. Cirrhosis of the liver	52
Latin America and the Caribbean	
1. Ischaemic heart disease	348
2. Cerebrovascular disease	249
3. Lower respiratory infections	178
4. Diarrhoeal diseases	153
5. Road traffic accidents	109
6. Violence	102
7. Birth asphyxia and birth trauma	91
8. Diabetes mellitus	89
9. Tuberculosis	78
10. Cirrhosis of the liver	62
Sub-Saharan Africa	
1. Lower respiratory infections	1 006
2. Diarrhoeal diseases	950
3. Malaria	732
4. Measles	576
5. Tuberculosis	386
6. Cerebrovascular disease	383
7. War	268
8. Low birth weight	249
9. HIV	239
10. Ischaemic heart disease	209
Northern Africa, South-central and Western Asia	
1. Ischaemic heart disease	610
2. Lower respiratory tract infections	525
3. Diarrhoeal diseases	424
4. Cerebrovascular disease	212
5. Low birth weight	199
6. War	169
7. Tuberculosis	109
8. Measles	96
9. Birth asphyxia and birth trauma	94
10. Tetanus	83

Source: C. J. L. Murray and A. D. Lopez, eds., *The Global Burden of Disease: A Comprehensive Assessment of Mortality and Disability from Diseases, Injuries, and Risk Factors in 1990 and Projected to 2020* (Cambridge, Massachusetts: Harvard School of Public Health on behalf of World Health Organization and World Bank, 1996), annex tables 6a-6h.

distribution of behavioural and other risk factors for chronic diseases (Himes, 1994). Such regional differentials are illustrated here by the differences in mortality by cause of death between established market economies and former socialist economies of Europe. In the latter, mortality tends to be higher from causes common in both regions. In addition, a much higher level of mortality due to injuries in former socialist economies of Europe than in established market economies contributes to mortality differentials between the two regions.

Future gains in life expectancy in developed countries largely depend on future trends in mortality from chronic diseases at the oldest ages, and on mortality from injuries where such causes make a particularly large contribution to the country's cause-of-death profile. Although forecasting the future is uncertain, recent evidence suggests that declines in old age mortality are likely to continue. Kannisto and others (1994, p. 794), for example, found that "in most developed countries outside of Eastern Europe, average death rates at ages above 80 have declined at a rate of 1 to 2 per cent per year for females and 0.5 to 1.5 per cent per year for males since the 1960s", with the pace of decline accelerating during the twentieth century. Similarly, Lee and Carter (1992) have shown that in the United States the pace of mortality decline has been surprisingly even during the course of the twentieth century with no deceleration in improvement over time. Further declines also appear possible with changes in behaviour and advances in medical technology (Manton, Stallard and Tolley, 1991; Preston, 1996).

In developing countries, the course of the epidemiological transition has varied greatly from place to place. Of the regions and countries examined here, the transition has progressed furthest in China, where over two thirds of all deaths have been attributed to non-communicable diseases. Communicable diseases accounted for only 16 per cent of all deaths in China in 1990. It is interesting to note, however, that the relative contribution of specific chronic diseases in China differs from that in established market economies and former socialist economies of Europe. That cause-of-death patterns vary between low-mortality Asian countries, including Japan, and industrialized countries of Western Europe and Northern America is well known. Mortality from cerebrovascular diseases, particularly haemorrhagic stroke, is, for example, far more common in Asian countries than in Western Europe and Northern America, while ischaemic heart disease plays a more important role in cardiovascular disease mortality in Western than in Asian countries (Chang and Chen, 1993; Goldman and Takahashi, 1996). In the Chinese case, chronic obstructive pulmonary disease and liver cancer also stand out as important causes of chronic disease mortality. Such differentials illustrate that mortality from non-communicable diseases can vary substantially from place to place reflecting differentials in risk-factor profiles among countries and regions.

In the other developing regions, the epidemiological transition is not as far along as in China and in the developed countries. For example, although non-communicable diseases now make up a higher proportion of all deaths than communicable diseases in Latin America and the Caribbean, other Asia and Pacific islands, and Northern Africa and South-Central and Western Asia, the latter account for a third or more of all deaths in these areas. In India and sub-Saharan Africa, communicable diseases continue to dominate cause-of-death profiles. What is perhaps most disturbing about the findings presented here is that many of these diseases are either preventable or curable with modern medical technology.

The growth in chronic-disease mortality alongside the continued burden from communicable diseases has meant that many developing-country Governments are now faced with increasing pressure to shift scarce health resources away from the prevention and treatment of childhood infectious diseases to the treatment of chronic and degenerative diseases of adulthood. How Governments respond to these pressures is likely to have important distributional consequences in the allocation of health resources. Within countries, the epidemiological transition appears to have occurred along socio-economic lines, with a growing prevalence of chronic and degenerative diseases of adulthood among the better off, while communicable diseases remain relatively more prevalent among the poor (Bobadilla and others, 1993; Gwatkin, 1993; World Health Organization, 1995b). A shift away from the prevention and treatment of childhood infectious diseases could also have long-term consequences for the development of chronic diseases inadulthood, many of which have infectious origins (for example, rheumatic heart disease, stomach cancer and respiratory diseases) (Elo and Preston, 1992; Mosley and Gray, 1993). Given the diversity in the pace of epidemiological transition among regions, and among countries within regions, it is becoming increasingly important to design health-care policies based on knowledge of local circumstances, and to consider the short- and long-term implications of shifts in the allocation of health-care resources between the prevention and treatment of communicable and non-communicable diseases.

NOTES

[1]United Nations medium variant projections.

[2]The causes included in this category are measles, pertussis, neonatal tetanus, and tuberculosis.

[3]Including the following countries: Afghanistan; Algeria; Armenia; Azerbaijan; Bahrain; Cyprus; Egypt; Georgia; Iran; Islamic Republic of, Iraq; Israel; Jordan; Kazakhstan; Kuwait; Kyrgyzstan; Lebanon; Libyan Arab Jamahiriya; Malta; Morocco; Oman; Pakistan; Qatar; Saudi Arabia; Syrian Arab Republic; Tajikistan; Tunisia; Turkey; Turkmenistan; United Arab Emirates; Uzbekistan; West Bank and Gaza Strip; Western Sahara and Yemen (Murray and Lopez, 1996, pp. 398-399).

[4]Including the following countries: American Samoa; Bangladesh; Bhutan; Brunei Darussalam; Cambodia; Cook Islands; Democratic People's Republic of Korea; Federal States of Micronesia; Fiji; French Polynesia; Guam; Hong Kong, China; Indonesia; Johnston Island; Kiribati; Lao People's Democratic Republic; Macau; Malaysia; Maldives; Marshall Islands; Mauritius; Midway Islands; Mongolia; Myanmar; Nauru; Nepal; New Caledonia; Niue; Northern Mariana Islands; Palau; Papua New Guinea; Philippines; Pitcairn; Republic of Korea; Reunion; Samoa; Seychelles; Singapore; Solomon Islands; Sri Lanka; Taiwan Province of China; Thailand; Tokelau; Tonga; Tuvalu; Vanuatu; Viet Nam; Wake Island; and Wallis and Futuna Island; (Murray and Lopez, 1996a, pp. 398-399).

[5]In subsequent discussion, these causes will be referred to simply as communicable diseases.

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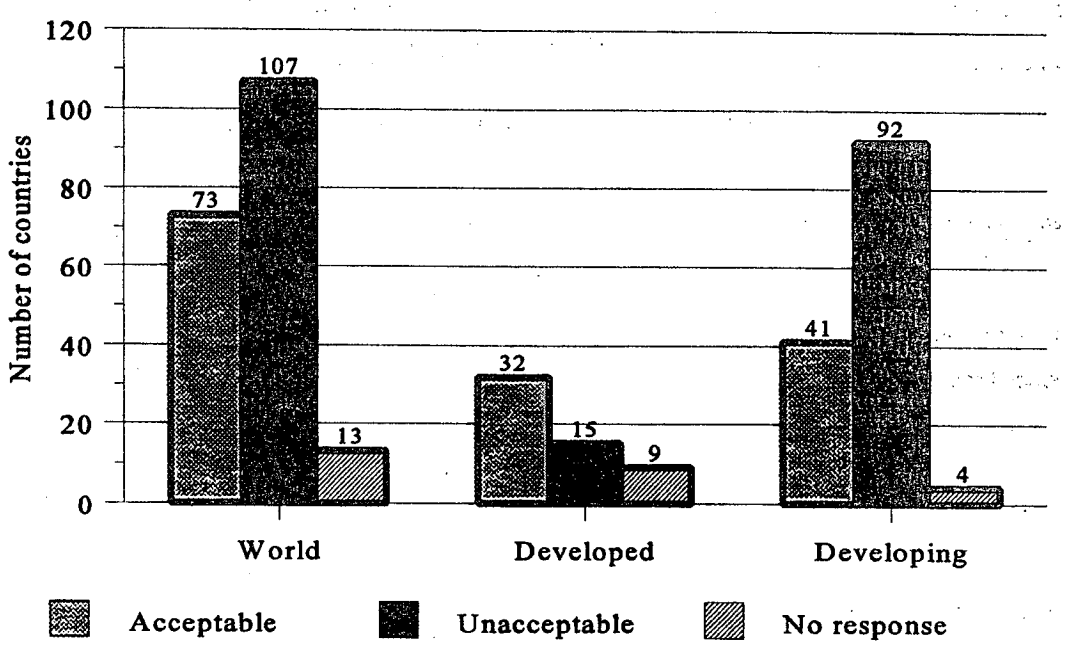
VII. HEALTH AND MORTALITY POLICIES

The pursuit of health is central to the achievement of all social and economic goals by individuals, families, communities and societies. The primary health care approach has provided a blueprint for the formulation of health policies at both the national and the international level. Since the International Conference on Primary Health Care held in Alma-Ata in 1978, which provided an impetus to the primary health care movement, virtually all countries in the world have adopted "Health for All" strategies. Health for All has also been instrumental in putting health at the center of the development agenda. As a result, health has become seen as one of the fundamental human rights. In keeping with this approach, the Programme of Action of the International Conference on Population and Development, (United Nations, 1995, chap. I, resolution 1, annex) reaffirmed that increasing access to primary health care and health promotion constitute central strategies for reducing mortality and morbidity.

Despite the considerable progress made in increasing life expectancy worldwide, in reality there is no acceptable level of mortality, and no Government considers the levels of mortality in a country to be fully satisfactory. However, Governments characterize levels of mortality as "acceptable", given the level of medical technology and the resources available for reducing mortality. As of 1995, 73 countries worldwide considered their mortality levels to be acceptable and 107 countries regarded them as unacceptable. Not surprisingly, 86 per cent of the countries that regarded their mortality levels as unacceptable were developing countries (figure 19).

The level of mortality achieved in a country influences not only government perceptions but also the types of health concerns expressed by the Government. In the developing countries, infant and child survival and maternal mortality are the principal concerns of Governments. More than half

Figure 19. Governments' views regarding acceptability of mortality levels, 1995



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

of the developing countries and about two thirds of the least developed countries consider infant mortality a major concern (table 40). Approximately one fifth of the developing countries and slightly less than one third of the least developed countries view the level of mortality of mothers or pregnant women with concern; and the same proportions hold with respect to concern over mortality of women of reproductive age. Among the 53 African countries, 38 countries have concerns about the level of infant mortality and 30 countries about the level of child mortality. Eighteen African countries indicate serious concern for the level of mortality of mothers or pregnant women and 17 for that of women of reproductive age. Out of a total of 46 Asian countries, 18 countries are concerned about their level of infant mortality and 7 countries about their level of child mortality. Among the 33 countries of Latin America and the Caribbean, corresponding figures were 15 countries and 13 countries, respectively.

In the more developed regions of the world, the level of mortality of adult men as a whole or of adult men in specific age groups is one of the major concerns (table 40). High and/or increasing mortality among adult men was viewed as an issue of particular concern in Eastern Europe. The deterioration of the health situation in Eastern Europe that occurred during the first half of the 1990s raised concerns regarding the levels of infant and child mortality.

A. Overview of the epidemiological transition

Over the past decade, there has been a dramatic improvement in the control of preventable diseases, in particular infectious diseases of childhood. Immunization coverage has risen dramatically to reach a global average of about 80 per cent for diphtheria-pertussis-tetanus (DPT), measles and poliomyelitis in the early 1990s (United Nations, 1996). In the case of poliomyelitis, global prospects for eradication in the near future seem quite good. On a more limited scale, Guinea worm is another disease that is on the verge of elimination as a result of the rapid success of the eradication programmes implemented in the early 1990s. Considerable progress also has been made in home management of diarrhoea, a major killer of children, through the use of oral rehydration therapy (ORT). Recently, programmes have been undertaken that are aimed at controlling acute respiratory infections, one of the most common causes of death among children under age 5 in the developing world. By the end of 1994, out of 88 developing countries where bacterial pneumonia was prevalent, 59 had started such programmes (United Nations, 1996). However, global figures conceal large regional discrepancies. Immunization coverage is still low and has been improving very slowly in a dozen sub-Saharan countries as well as in a few countries in South Asia. Also, progress in the treatment of diarrhoeal disease using ORT has been very slow in South Asia.

TABLE 40. POPULATION GROUPS WHOSE MORTALITY LEVELS ARE OF PARTICULAR CONCERN TO GOVERNMENTS BY MAJOR AREA OR REGION

		Population group					
Major area or region	*Total number of countries*	*Infants*	*Children, especially under age 5*	*Mothers and/or pregnant women*	*Women of reproductive age*	*Males*	*Other*
World	193	84	57	29	30	17	29
More developed regions	56	14	7	0.00	2	14	12
Less developed regions	137	70	50	29	28	3	17
Least developed countries	48	31	23	15	14	0.00	3
Africa	53	38	30	18	17	0.00	4
Asia	46	18	7	7	6	2	6
Europe	43	9	5	0.00	1	12	8
Latin America and the Caribbean	33	15	13	3	6	2	7
Northern America	2	1	1	0.00	0.00	1	2
Oceania	16	3	1	1	0.00	0.00	2

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

In contrast to these recent successes, the deadly comeback of major diseases such as malaria, tuberculosis and cholera in Africa, South and South-eastern Asia and Oceania points to the fact that the prevention and control of infectious diseases require sustained intervention. In many parts of the developing world, deteriorating living conditions provide an ideal breeding ground for epidemics. For about two decades, the search for new antimicrobials has lagged far behind the development of resistance by disease-causing organisms to antibiotics and other drugs. As a result, the fact that many infections, including malaria and tuberculosis, have become more difficult, and sometimes impossible, to treat allows more time for epidemics to spread and to reach wider geographical areas. In addition, new infectious diseases have emerged which pose new health threats. Some of these emerging diseases such as human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) and hepatitis C already have reached global significance. In most cases, there currently is no available treatment, and this results in high mortality among infected people. In addition, certain emerging diseases associate themselves with or induce other pathologies, resulting in co-epidemics such as that of AIDS and tuberculosis.

While the burden of parasitic and infectious diseases remains heavy, developing countries are faced with another major health challenge: the surge of non-communicable diseases. This "double burden" is typical of countries experiencing an epidemiological transition. Mortality decline always brings about a shift in leading diseases and causes of death from the infectious and acute to the chronic and degenerative. This shift in causes of death also reflects the growing importance of adult health and mortality as many more children survive the diseases of infancy and childhood.

In the developed countries, chronic conditions are the dominant causes of ill health and mortality. In 1990, it was estimated that cardiovascular diseases and cancers accounted on average for 45 per cent and 25 per cent of total deaths, respectively (Murray and Lopez, 1996). Other major causes of death or ill health and disability include respiratory diseases, digestive diseases and injuries, each of them representing a percentage of deaths of the order of 5 per cent, on average.

The newly independent States of the former Soviet Union have been faced with one of the most dramatic health declines ever experienced in modern history as evidenced by the considerable drop in life expectancy. Most of the increase in mortality seems to be related to the linkage of behavioural factors to worsening living conditions, resulting, for example, in accidents, violence and homicide, suicide, stress and alcohol-related cardiovascular deaths (World Health Organization, 1994).

With much of the gain in life expectancy now occurring at older ages and with rapid population ageing about to take place in many developing countries, the health and special needs of older persons have become a focus of increasing concern. Long-term assistance and care in relation to functional limitation, multiple chronic illnesses and impairments, in particular among the oldest old, have translated into a growing demand for health care and a steep rise in health-care expenditures.

B. Overview of health policies

With both the final evaluation of the strategy for Health for All by the Year 2000 and the first end-of-decade review of the goals of the World Summit for Children due to be completed, the late 1990s offer some interesting opportunities to study the effects as well as the relevance of international and national policy efforts in regard to health. Indeed, in the final decade of the twentieth century, reform and policy evaluation issues dominate the debate on health policies in both developed and developing countries. In developed countries, the rapid growth of health expenditures that has taken place despite the adoption of cost containment measures has lead to comprehensive reform proposals aimed at fostering competition between health providers. In developing countries, the focus of health policy reform is twofold. In many countries, efforts have been made to enhance the effectiveness of health-care delivery and equity in access to health services through a reallocation of resources from the hospital sectors towards the primary health-care system. At the same time, the epidemiological transition which has occurred in most of the developing world has brought about changes in disease prevalence that call for a reassessment of health priority interventions. In addition, new health challenges have appeared in the form of emerging and re-emerging infectious diseases.

1. *Child health and survival*

The strategy followed for reducing child mortality and morbidity has undergone major revisions over the past two decades. In the aftermath of the International Conference on Primary Health Care, improvement in child survival was sought through a host of interventions. In the mid-1980s, the difficulties faced by many developing countries in making provision for the delivery of basic health services led to a more selective approach to primary health-care. The emphasis shifted to effective interventions that could have a quick impact on mortality and morbidity. The impressive success of immunization programmes implemented in developed countries from the late 1950s onwards as well as of the WHO smallpox eradication programme pointed to vaccines as being the one intervention that could probably have the greatest impact on health.

The adoption by the Forty-second World Health Assembly in 1989 of an agenda for the Expanded Programme on Immunization in the 1990s in the form of time-bound and measurable goals constituted a major strategic development towards stronger political commitment, increased resource mobilization and accountability. The goal strategy also stemmed from the fact that capacity-building in the area of data collection had critical policy relevance in so far as many developing countries' data-collection systems did not permit minimal tracking of child health or basic programme monitoring. The goal approach was further endorsed at the highest political level at the World Summit for Children in 1990. The International Conference on Population and Development reaffirmed the goals for children with a special emphasis on the overall reduction of infant, child and maternal mortality. While setting specific goals for overall levels of infant and under-five mortality, the main focus of the

goals is on the control or elimination of major childhood diseases. The disease prevention component of the goal strategy includes interventions such as immunization against six major childhood diseases (diphtheria, pertussis, tetanus, measles, poliomyelitis and tuberculosis), promotion of breastfeeding, elimination of micronutrient deficiency disorders by means of salt iodization and vitamin A supplementation, and elimination of water- and food-borne disease vectors through improved sanitation and access to safe water. The disease management component encompasses home management of diarrhoea using ORT and case management and antibiotics treatment of acute respiratory infections.

Given the economic difficulties that many developing countries faced in the early 1990s, the overall progress made towards the fulfilment of the goals for children can be considered to have been globally remarkable. Immunization coverage, prevention of iodine deficiency disorders and promotion of breastfeeding are the areas in which most progress has been reported. Access to safe water and ORT usage have also improved considerably in certain parts of the world. On the other hand, the areas of weakest progress have been the reduction in protein-calorie malnutrition and the spread of sanitation services.

2. *Women's health and safe motherhood*

Although pregnancy and childbirth have become somewhat safer in many countries, an estimated 585,000 women die each year from maternal causes. Indeed, WHO estimates that about half of the women in the developing countries still give birth without any trained assistance and cannot reach medical help in an emergency. As part of the Global Strategy for Health for All, WHO is collaborating with countries to ensure that all women have community-based maternity care during pregnancy and delivery, and access to a hospital or clinic in the case of life-threatening obstetric complications.

An increasing number of countries have taken initiatives in recent years to improve maternal health. In Turkey, the Safe Motherhood Programme has been implemented since 1995 and the plan is to extend it to the entire country by the year 2000 (Government of Turkey, 1998). A number of countries, including Bangladesh, Cuba, Ethiopia, Indonesia, Malawi, Mongolia, Mozambique, Nicaragua, Papua New Guinea and Zimbabwe, have established maternity waiting homes, which provide accommodation near a health facility for women in the later stages of pregnancy. The Republic of Korea recently reported that it had adopted a compulsory screening programme for women to detect uraemia, diabetes, rubella and other high-risk diseases during pregnancy. The Philippines reported that it was promoting the "four pillars of safe motherhood", encompassing family planning; quality prenatal care; clean, safe deliveries; and emergency obstetric care. Fiji reported that it had developed rural maternity services and was promoting 100 per cent hospital births.

A number of countries have recently adopted a comprehensive focus on women's health. The Government of Canada, for example, has established a network of 5 centres of excellence for women's health. In addition, many federal initiatives in Canada address women's health, including those focusing on reproductive health, breast cancer, women and AIDS, seniors, family violence and the inclusion of women in clinical trials. Australia is one of the few countries in the world to have adopted a National Women's Health Policy, which focuses on such priority issues as reproductive health and sexuality; health of ageing women; women's emotional and mental health; violence against women; occupational health and safety; and the health needs of women as caregivers. In Israel, the basket of services provided under the National Health Insurance Law takes women's health into account and thus includes gynaecology, obstetrics, fertility treatment and early detection of breast and uterine cancer. Efforts are also made to meet the special health needs of women over age 50.

3. *Human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS)*

A health concern common to both the developed and the developing countries is the spread of AIDS, which has not only diverted attention from other health-care issues but also threatened to siphon off a significant proportion of the funds devoted to medical research. At the beginning of the 1980s, only about 100,000 persons worldwide were infected with HIV. It is estimated that some 30.6 million people around the world are now living with HIV. In recent years, the epidemic has expanded its geographical scope. The pandemic has become extraordinarily complex and increasingly diverse at the national, provincial and community levels, reflecting the great variety of economic, social and cultural circumstances that create and enlarge the potential for exposure to HIV.

The global AIDS strategy focuses, among other things, on better treatment and prevention programmes for other sexually transmitted diseases; greater focus on prevention of HIV infection through improvement of women's health, education and status; and greater support to prevention programmes.

Two-thirds of the people infected with HIV live in sub-Saharan Africa; it is now acknowledged that the epidemic in that region was badly underestimated even though it had been known to be severe. Although most Governments in Africa have adopted special measures to prevent or reduce the occurrence of AIDS, many have experienced major difficulties with regard to the availability of resources needed to address the problem. Among the measures taken have been the establishment of AIDS control and prevention programmes, emphasis on information, education and communication programmes (IEC), training of health-care workers, epidemiological surveillance of AIDS cases, sensitivization and public awareness campaigns, systematic testing of blood donors, promotion of the use of condoms as a preventive measure and screening of high-risk groups.

In Kenya, a vigorous campaign against AIDS has been conducted through the mass media and various other mechanisms, including the "social marketing" of condoms.

Namibia has established the National AIDS Control Programme, which includes production and dissemination of IEC materials on prevention and control of AIDS; training of health workers; HIV testing of all blood donations; promotion of the use of condoms; and establishment of a surveillance system. The Government of South Africa recently adopted a National Plan whose central tenet is a call for mass mobilization, the removal of all discriminatory practices and a more focused coordination of multisectoral responses. In Swaziland, AIDS prevention efforts have involved a nationwide project directed to out-of-school youth, members of literacy groups, traditional healers, firemen and owners of local bars. Uganda has mounted an aggressive campaign to address HIV/AIDS, using communication and non-formal education activities through the mass media, agriculture and organized labour. One family life education project aims to promote HIV/AIDS prevention through the production and dissemination of audience-specific messages and the distribution of condoms to intercountry truck drivers and tourist hotels in overnight stopover centres. The United Republic of Tanzania has undertaken HIV/AIDS prevention IEC activities through awareness campaigns, radio broadcasts and radio soap-operas. In several African countries, non-governmental organizations have spearheaded a number of innovative project to combat the pandemic. In Cameroon, for example, one non-governmental organization has attempted to train commercial sex workers to be peer educators.

As concerns policy responses to the AIDS pandemic in Asia, the Government of China has established a network of epidemiological prevention centres, testing sites and wide-ranging sexuality education/HIV prevention programmes; monitoring stations also have been set up in a number of cities. The Government of Thailand has undertaken an aggressive AIDS prevention campaign and AIDS prevention programmes; these activities have made substantial progress in reducing the number of new infections, which have dropped almost fourfold since 1990. In response to the growing crisis, the Ministry of Public Health has shifted its attention to targeting health promotion programmes aimed at commercial sex workers and their clients. In addition, the Government and non-governmental organizations have initiated a programme to buy the drug AZT (zldovudine; chemical name: azidothymidine) in order to treat pregnant mothers and their newborns; in this programme, funds to buy the drug are being raised from the general public and businesses, while the necessary care is provided by participating hospitals. Thailand has also introduced various projects to care for and support children orphaned by AIDS within the community and family networks. The Government of India has pursued various initiatives in different cities, including screening of blood donors, introduction of condoms for prostitutes and a newsletter for homosexual men. In Pakistan, attention has focused on blood transfusion services; the country is promoting safe sex, the screening of blood, the use of disposable syringes and an extensive health education campaign. Japan has emphasized health education through various measures, such as videos, leaflets and pamphlets. Singapore has emphasized surveillance, public education, and counselling and support services for high-risk persons.

In Latin America, policy responses have included strengthening of laboratory services and promotion of universal blood-screening, which has decreased blood-borne transmission in most countries of Latin America. The National Council for the Control and Prevention of AIDS in Mexico has been using the mass media in various ways to provide the general public with information on AIDS; one innovative approach has been an AIDS information campaign centred around the Mexico City metro. In Chile, the Government has produced a special video and sponsored AIDS-awareness skits in various public places. The Government of Colombia has conducted educational campaigns intended to encourage the use of condoms. The AIDS policy in Cuba has included mandatory screening of the entire population and the quarantine of all HIV-positive persons.

In recent replies to the Eighth United Nations Population Inquiry among Governments, a number of Governments indicated that they had adopted measures to include the participation of non-governmental organizations, and people living with HIV/AIDS in designing and implementing HIV/AIDS-related policies and programmes. The United Kingdom of Great Britain and Northern Ireland reported that it had a long-standing practice of involving non-governmental organizations and people living with HIV/AIDS in policy development and implementation. Norway reported that it had established a Health Committee for Gay People and had organized support groups for HIV-positive persons. Finland likewise reported that it had established a number of AIDS support centres. In its reply to the Eighth Inquiry, the United States of America reported that non-governmental organizations and other civil society groups were involved in a wide variety of consultative bodies and processes dealing with HIV/AIDS. Brazil reported the establishment of a committee on HIV/AIDS comprising representatives of various social groups, including non-governmental organizations.

4. *Lifestyle diseases*

Voluntary health risks, such as tobacco use and alcohol consumption, contribute to higher mortality in both developed and developing countries and are expected to cause an even larger number of deaths in the future. Although global consumption of cigarettes remained relatively constant in the decade of the 1990s, there is evidence that smoking prevalence is declining in developed countries but continuing to rise in developing countries. In China, for example, cigarette consumption per adult has nearly tripled since the early 1970s. Current mortality rates in developing countries reflect much lower levels of tobacco use than in the past; if present trends continue, however, cause-of-death projections estimate that smoking will cause 8.4 million deaths in 2020, of which 6 million will occur in the developing world (Lopez, 1997).

Policy responses to mortality resulting from voluntary health risks have been pioneered by Governments in developed countries. Public-health initiatives have confronted the issue of tobacco use with a variety of approaches, including restrictions on the sale of tobacco products, health warnings on cigarette packages, higher prices through additional taxes, and bans on smoking in public places. Young people have been a particular target of anti-smoking programmes,

since early tobacco addiction increases the risk of eventually dying from a smoking-related disease. In some countries, access to counselling and support groups has been made readily available to people who want to stop smoking. In Australia and South Africa, for example, the telephone numbers of such groups are printed on every cigarette package.

Comprehensive tobacco control policies have been recommended by the World Health Assembly. To the extent that these programmes have been adopted, there is clear evidence that they are effective. The United Kingdom and Finland, in particular, have reduced the number of deaths caused by lung cancer. Restrictions on the advertising of tobacco products have been tried in many countries with mixed results. In the United States, for example, the 1971 ban on tobacco advertising on radio and television diverted advertising revenue to other media outlets. A study of 22 Organization for Economic Cooperation and Development (OECD) countries found that the strongest deterring effects on smoking were realized with a combination of price increases, advertising bans and health warning labels (Lopez, 1997).

The mortality consequences of alcohol use have also elicited a broad range of policy responses, including regulating the production and sale of alcohol; increasing the probability of being apprehended for drunk-driving; and training health workers to recognize alcohol addition. Many countries limit the hours and locations for purchasing alcoholic beverages, both by the bottle and by the drink; about 55 countries have laws to prevent sales of alcohol to young people. However, lack of enforcement of such laws often limits their effectiveness. In Canada, the United States and the Netherlands, the sale of alcohol to intoxicated persons is illegal. The concept of a legal limit of blood-alcohol concentration has been accepted in more than 50 countries, especially for such activities as driving a car or piloting an airplane. The limits vary widely, even though it has been established that even a small amount of alcohol can severely increase the risk of accidents.

In Asia, where there has been a rapid rise in lifestyle-related diseases in recent years — related to such factors as population ageing, abandonment of traditional diets, tobacco smoking and sedentary behaviour — a number of countries have adopted policies aimed at promoting healthy lifestyles. In Malaysia, for example, educational programmes disseminated through the mass media, schools and community groups have included efforts to control alcohol and substance abuse; prevent sexually transmitted diseases and HIV/AIDS; and generate awareness regarding the need for regular exercise and a balanced diet.

C. Health-care reform

Health-care reforms dominate the debate on health policies in both developing and developed countries. Despite significant progress made in the implementation of primary health care in developing countries, in particular the notable success of immunization programmes, there has been growing concern with the fact that large and increasing numbers of people belonging to the poorer socio-economic groups or people living in rural areas have little or no access to basic health care (Institute of Medicine 1996). Although universal access to basic health services is a core principle of the primary health care approach, very few countries have adopted equity-based health policies and strategies. The fact that, in the large majority of low-income countries the bulk of the limited public funds allocated to the health sector are absorbed by the hospital system, leaves little resources for the primary-level health-care system which deals with the basic and essential health needs of the entire population.

In an increasing number of developing countries, there are major efforts under way to decentralize national health-care systems. In Kenya, the Government is implementing a Health Sector Reform Programme aimed at decentralizing health administration from the central Government to the district level. Through this decentralization programme, the Government expects to enhance efficiency, widen the scope and improve the quality of services, improve accessibility and affordability for recipients and foster a sense of "ownership". The new Administration in South Africa has adopted a policy which is characterized by shifting resources from the tertiary to the primary level and expanding primary health care services to hitherto marginalized communities; the Government is currently implementing the district system as the institutional vehicle for the delivery of comprehensive primary health care (Government of South Africa, 1998).

In Bangladesh, reforms are being undertaken in the health sector in the areas of management structure, service delivery mechanisms and utilization of public and private sector resources. The Government is emphasizing a decentralized management system and the fullest community participation and support in order to make all health programmes cost-effective and sustainable.

China is currently undertaking a reform of its health-care programme. The reform of its medical coverage system for urban employees will be strengthened by establishing a medical insurance structure that combines overall social planning with individual accounts; rural medical coverage is being continuously developed and improved with the co-operative medical care service as its major structure. The Government at all levels is required to extensively mobilize the community to take comprehensive measures for the elimination or control of infectious and endemic diseases.

Indonesia has made substantial investments in the development of the basic infrastructure and human resources for a comprehensive primary health care delivery system. At present, each of the country's 3,400 subdistricts has at least one such facility. Health infrastructure at the national level has been strengthened for supporting health-care delivery by front-line primary health care workers. This effort includes training more than 11,000 midwives every year so that within five years each village will have a midwife. In its reply to the Eighth United Nations Population Inquiry among Governments, the Republic of Korea reported that it had promulgated a national Health Promotion Law in 1995, according to which each local government was obliged to set up a health plan every five years to improve the health status of residents.

Turkey is also undergoing a process of health-care reform. In the proposed system for primary health care, the family physician will provide individual preventive services and primary-level curative services. The health reform foresees

the replacement of the current structure of the Ministry of Health by an effective and flexible organization that sets policies, and national standards for health-care, prepares plans, and monitors and evaluates the implementation of policies. Local decision-making through a decentralized system lies at the heart of the health-care management reform.

In Brazil, the health sector has been undergoing a thorough reform. Community participation is becoming a reality in Brazil through a network of health councils that have been set up in approximately 3,000 municipalities. As part of the decentralization strategy, municipalities are given the option of being responsible for primary health care services only or of taking over the entire health sector within their territory. The family doctor programme is another example of the emphasis that is being given to primary health care in Brazil; since these doctors belong to the community, they can more easily identify the basic needs of their patients, as well as act as gatekeepers in the referral process within the National Health System.

Jamaica is in the process of transforming the country's four administrative health regions into Regional Health Authorities. The Government is also adopting a national health insurance plan, which is expected to provide universal coverage in the form a basic basket of health-care services, tests and drugs in order to ensure an equitable health-care system.

In the developed countries, the debate on health-care reform has been driven largely by economic considerations. Since the 1960s, the share of total and public spending in GDP has increased rapidly. It was estimated that total health expenditure represented on average 8.4 per cent of gross domestic product (GDP) in OECD countries in 1992, compared with 3.9 per cent in 1960 (Organization for Economic Cooperation and Development, 1995). Faced with budgetary constraints, virtually all Governments have adopted reforms aimed at imposing some form of overall limit on health spending. Initially targeted at the hospital sector, these measures have often been extended to ambulatory care and pharmaceuticals. Reduction of spending through a reduction of the demand for health-care also has been attempted by increasing cost-sharing. As a result of cost containment measures, the increase in health spending has slowed in several countries, particularly in Europe, but has not come to a halt. The outcome of cost-sharing measures has been somewhat mixed. By and large, it has resulted in a shift from public to private spending with limited bearing on total spending. In addition, that the impact of cost-sharing has turned out to be significantly greater at lower income levels raises serious concern about the implication of cost-sharing in terms of equity.

A common approach to developing new health-care policies is that substantial reduction in costs can be achieved through greater efficiency and effectiveness in the provision of services. Until recently, the concept of cost-effectiveness has been largely absent from health management, as illustrated by the fact that four fifths of medical procedures and two thirds of medical goods have never been evaluated for their effectiveness or cost (Oxley and MacFarlan, 1994). Much of the new technology has been accepted without serious evaluation and the supply of doctors and hospital beds has long grown unchecked. Central to these reform proposals is a redefinition of the function of health funding agencies, whether public authorities or private insurers, in terms of a shift from their performing simply a funding role towards their serving as active purchasing agents of health-care. Enabling competition between health providers is another major component of the new approaches to health service delivery.

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VIII. HEALTH AND DEVELOPMENT: ISSUES AND CHALLENGES

A long and healthy life is one of the most highly coveted components of human existence. Good health is an attribute that individuals have sought for themselves and their families, since the dawn of time. From the discovery of a smallpox vaccination in 1780 to the search for an acquired immunodeficiency syndrome (AIDS) vaccine in the 1990s, societies have sought to improve health conditions and extend the limits of life. Health and longevity are not merely intermediate goals on the path to socio-economic development, but rather belong among the fundamental pillars of development.

The concept of government responsibility for ensuring the health of its population has become firmly entrenched as a cornerstone of national priorities. The Programme of Action of the International Conference on Population and Development in 1994, inter alia, calls upon all Governments to reduce mortality and morbidity. To guide countries in this endeavour, the document lays out a detailed description of quantitative goals in the area of health and mortality (life expectancy, infant, child and maternal mortality) and specifies the target dates for achieving each of these goals (United Nations, 1995a, chap. I, resolution 1, annex, chap. VIII).

The twentieth century has witnessed unprecedented gains in human health and longevity. Between 1950 and 1995, life expectancy at birth increased on a global basis from 47 to 64 years, or 17 years. Among developing countries the increase in life expectancy has been even more impressive, climbing during the same period from 41 to 62 years for a total increase of 21 years (United Nations, 1998). Despite the considerable progress in combating morbidity and mortality that these figures attest, Governments continue to express dissatisfaction with national mortality levels. During the period 1976-1995, the proportion of Governments that regarded their level of life expectancy as unacceptable dipped only 1 percentage point, from 63 to 62 per cent. Even among the 82 countries with the highest level of life expectancy, namely 70 years or more, nearly one third in 1995 viewed the level as unacceptable (United Nations, 1996b).

Underlying the dissatisfaction with current mortality conditions are the twin beliefs in many countries that health-care systems are not optimal and that more effective and efficient results can be obtained. Discussions on the means of improving health-care have revolved around a number of issues, including attempts to better understand the myriad and complex interrelationships between health and development.

Sparked by a host of global health threats, among which are malaria, newly emerging and re-emerging diseases (human immunodeficiency virus (HIV)/AIDS, tuberculosis, Ebola fever), the rising incidence of cancer and other chronic diseases, recent instances of increasing mortality, the mounting costs of medical care, the intractability of poverty, armed conflict, and environmental degradation, issues of health and development are undergoing renewed scrutiny. The purpose of the present chapter is to highlight some of the more important recent analytical and empirical findings that have surfaced from the vast and disparate literature on health and development.

Traditionally, research on the linkages between health and development has fallen into one of two categories; studies have focused on either the impact of development on health or, conversely, the impact of health on development.

A. Impact of development on health

The concept of development is an evolving one, which has been forged during four international development decades and a series of United Nations conferences. Since the 1960s, the concept of development has been transformed from a narrowly focused economic viewpoint to one stressing the social aspects and environmental sustainability of development. The quest to better integrate economic and social factors into development has given impetus to a strategy emphasizing health, family planning services, nutrition, education, safe drinking water, sanitation, shelter, poverty eradication and environmentally sustainable economic growth.

A common approach to measuring the contribution of socio-economic development to global mortality declines has been to undertake cross-national statistical analyses. Preston (1980) found that only about 30 per cent of improvements in survivorship between 1930 and 1960 were attributable to socio-economic factors, that is to say, income, literacy and nutrition. The remaining two thirds were due to other factors, such as anti-malarial programmes, immunization campaigns and promotion of personal health. A similar analysis for the period 1965-1969 to 1975-1979 found that, contrary to the earlier period, income, literacy and nutrition were the dominant factors in explaining mortality declines. It was suggested that the reduced effects of other factors could be attributable to a slackening in investments in health programmes during the more recent period (Preston, 1985).

Income is an important determinant of health, as it allows greater access, particularly among the poor, to food, housing and health-care. An examination of recent data on expectation of life at birth classified by per capita income confirms that life expectancy continues to be associated at the national level with income per capita (see table 41). The data reveal that life expectancy rises rapidly with income at low levels of income, particularly when per capita income enters the range of $2,000 to $3,999 (1994 purchasing power dollars), at which point the corresponding gain in life ex-

pectancy amounts to some 14 years. The income effect, however, tapers off at higher levels of income. As income rises to levels between $4,000 and $9,999, life expectancy increases some three and one half years, thus suggesting that income growth may have its greatest impact on the health status of very poor populations. This relationship is more clearly visible in figure 20. Further evidence of this relationship was found in a major study undertaken by the World Bank (World Bank, 1993), which determined that child mortality fell most steeply in countries where per capita income rose most rapidly.

Because poverty has a powerful influence on health, average per capita income is less relevant than the numbers of people living in absolute poverty and the distribution of income (relative poverty).[1] Poverty is characterized by deprivation of food, safe drinking water, sanitation facilities, medical care, adequate shelter, education and information. It has been found that poverty and per capita public-health expenditures help explain, in a statistical sense, country variations in life expectancy (World Bank, 1993). Per capita income was unimportant, once the other two factors were taken into account. Within countries, health also correlates strongly with poverty. In India, Indonesia and Kenya, child mortality is higher in States or provinces with larger proportions of poor people (World Bank, 1993). Within cities (Cairo, Colombo, Lima), child survival is lower in poor neighbourhoods than in wealthy neighbourhoods (World Bank, 1993).

It is clear that health depends on more than levels of income. In 1900, life expectancy in the United States was about 49 years, while per capita income in 1991 dollars was $4,800. In 1990 an income level of $4,800 would be associated with a life expectancy of 71 years. This upward shift in life expectancy over time implies that other factors are also contributing towards improving expectation of life. Despite the constraints imposed by low income, some developing countries have achieved low mortality (Halstead, Walsh and Warren, 1985). The fact that in China, Cuba, Costa Rica, the State of Kerala in India, Jamaica and Sri Lanka, life expectancy approximates that of developed countries demonstrates that health can be achieved when political commitment is translated into wide access to basic health services, education and food (Mosley and Cowley, 1991). A similar conclusion is reached by Nathanson (1996), who concluded that countries with unexpectedly low mortality are "distinguished by widely distributed public-health services (e.g., sanitation, immunization, maternal and child health)".

Development indicators are not confined to measures of income. A wide spectrum of development-related indicators have been deployed to evaluate the relationship between development and health. For example, there is virtual consensus that parental education, especially female education, is a key variable in influencing good health, especially among young children. In many low-income countries, the crucial determinant of child survival is the mother's level of education, even after household income and access to health services have been taken into account (United Nations, 1985; United Nations, 1991; United Nations, 1994). Data from 25 developing countries that took part in the Demographic and Health Surveys (DHS) conducted during the latter half of the 1980s revealed that universal provision of seven or more years of schooling might lower child mortality by a maximum of about 40 per cent (if all the maternal education differentials were a direct result of schooling) (United Nations, 1994). Other studies have examined the availability of infrastructure, and have demonstrated that access to safe drinking water and sanitation systems are positively associated with child health (Strauss, 1990; United Nations, 1985; 1991). The association between child mortality and access to sanitation can be viewed graphically in figure 21.

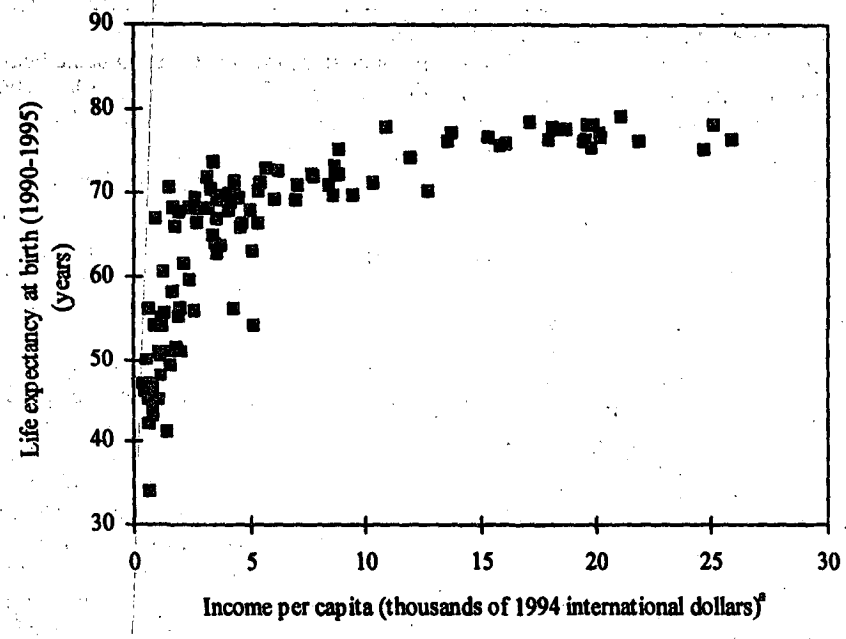
TABLE 41. RELATIONSHIP BETWEEN LIFE EXPECTANCY AND PER CAPITA INCOME

Income per capita (1994 international dollars) [a]	*Life expectancy at birth, 1990-1995 (years)*					*Total number of countries*
	Under 50	*50-59*	*60-69*	*70 or over (years)*	*Mean life expectancy*	
	(number of countries)					
Under 2,000	15	12	5	1	51.9	33
2,000-3,999	0	4	14	4	65.3	22
4,000-9,999	0	2	10	17	68.9	29
10,000 or over	0	0	0	26	76.2	26

Sources: Based on *World Population Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.XIII.5); and World Bank, *World Development Report 1996: From Plan to Market* (New York, Oxford University Press, 1996).

[a] Based on purchasing power parity (PPP) which is the number of units of a country's currency required to buy the same amounts of goods and services in the domestic market as one dollar would buy in the United States of America. The PPP is then applied to local currency gross national product (GNP) and divided by mid-year population.

Figure 20. Relationship between life expectancy and per capita income



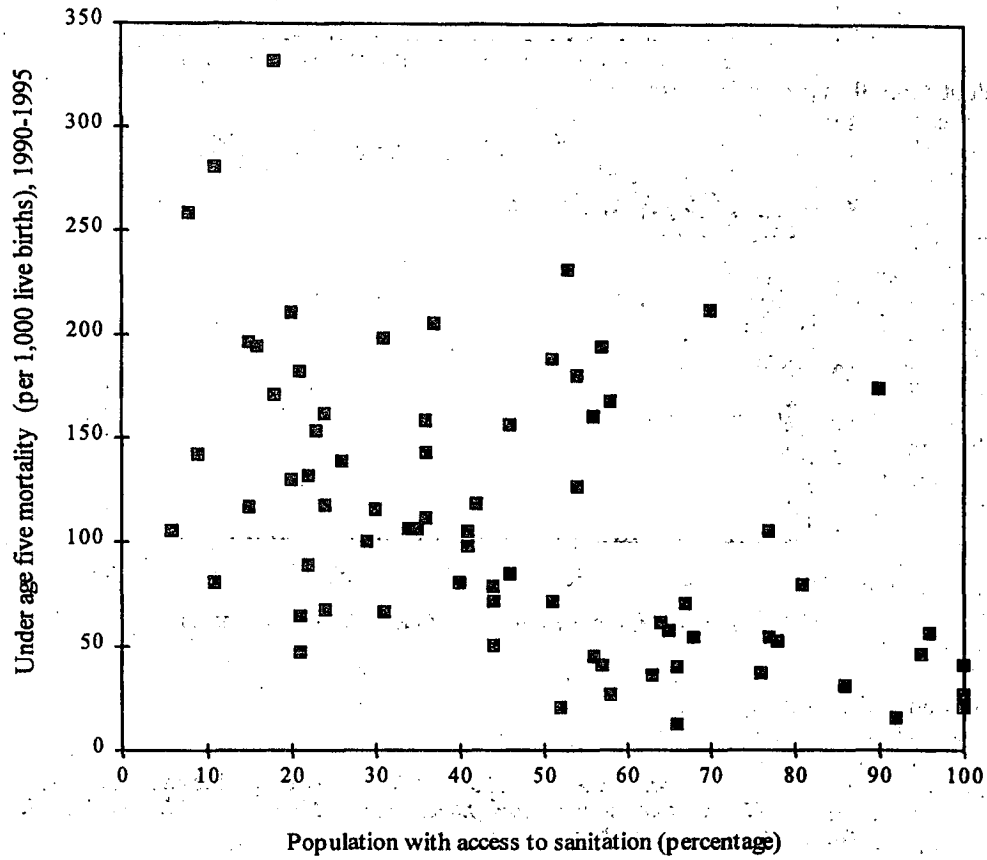
Sources: World Population 1996 (United Nations publication, Sales No. E.96.XIII.14); World Bank, *World Development Report, 1996: From Plan to Market.* (New York, Oxford University Press, 1996).

[a] Based on purchasing power parity (PPP), which is the number of units of a country's currency required to buy the same amounts of goods and services in the domestic market as one dollar would buy in the United States of America. The PPP is then applied to local currency gross national product (GNP) and then divided by the mid-year population.

Concomitant with the growing availability of household survey data for developing countries, a body of knowledge has accumulated on the socio-economic determinants of health at the individual and household level. In a review of these studies, Behrman and Deolalikar (1988) conclude that at the household level it is difficult to prove that higher income improves health. Such findings may reflect the strong positive correlation between income and other variables such as education. It may also be the case at the household level that (as was already noted at the macrolevel) other variables such as mother's education and access to safe water and sanitation may be more important determinants of health than income. In examining the literature, Birdsall (1992) posits that both income and prices have limited influence on health at the household level owing to the role of community-level variables such as climate, exposure to disease and quality of available healthcare, which may be more important than income and prices. Another explanation may lie in the methodological problems that plague these studies, for example, the improper specification of endogenous variables.

This brief review strongly suggests that based on time-series and cross-sectional evidence, a positive relationship exists between development and health. What is less well understood, however, is why and how development and health are related. Attempting to establish the linkages between health and development poses a number of conceptual problems. First, it is not clear which health indicator (consequence) is the most appropriate to use and, second, for each health indicator there exists a constellation of intermediate variables that can be considered the proximate determinants of that indicator.[2] Adult mortality and morbidity have been included in the list of indicators; however, given that research activities have been concentrated in two distinct areas — infant and child health and tropical diseases — a vacuum exists concerning studies that have scrutinized adult health. This has led one researcher (Genberg, 1992) to conclude that "the fact that many different channels of transmission are operating may account for the variety of national experiences and achievements in moving towards improved health. They may also explain why the contribution of health services and socio-economic development is not constant at different stages in that process".

Figure 21. Relationship between sanitation and under age five mortality in developing countries



Sources: Basic Social services for all, 1997 (United Nations publication, ST/ESA/SER.A/160, based on *World Population Prospects: The 1996 revision* (United Nations publication, Sales No. E.98.XIII.5) and WHO/UNICEF, *Water Supply and Sanitation Sector Monitoring Report, 1996 (New York, 1996).*

B. Impact of short-term economic changes on health

In recent years the focus of research on health and development has shifted from examining the long-term impact of economic changes on health towards assessing the consequences of shorter-term macroeconomic fluctuations. Interest has been concentrated in three areas:

(*a*) Impact of structural adjustment on developing countries;

(*b*) Repercussions of economic reform for countries with economies in transition;

(*c*) Consequences of economic stagnation in developed market economies.

1. *Structural adjustment and developing countries*

In the 1980s, a series of adverse global economic conditions, including weak external demand, declining terms of trade, limited sources of external finance and increased volatility of interest rates, contributed to a severe economic downturn in a number of developing countries and gave rise to the imposition of structural adjustment programmes in the most seriously affected countries. This was initially felt to have contributed to an erosion of health conditions, as countries pared government expenditures (Inter-American Development Bank, 1985; Jolly, 1988).

Given that few tools exist to gauge the impact of adjustment on health, it is difficult to establish a link between cause and effect. Earlier studies in Latin America established

an indirect link through intermediate variables that demonstrated reductions in health expenditures as a result of structural adjustment (Musgrove, 1990). "Although the impact may not have been direct, the pockets of poverty and ill health that preceded the period of recession persisted and were characterized by mutually reinforcing conditions of poverty and malnutrition, thus increasing susceptibility to illness" (Pan American Health Organization, 1994). In Latin America, it is now generally accepted that adjustment had little effect on the downward trend in child mortality, which was influenced by socio-economic factors such as primary health-care, improved sanitation, increased education and urbanization (Chackiel, 1997). In Côte d'Ivoire, it was found that adjustment was accompanied by increases in relative food prices (Thomas, Lavy and Strauss, 1996). In the short run, higher food prices had a detrimental impact on children as measured by weight for height and among adults based on body mass. Taking a somewhat different tack, Coussy and Vallin (1996) conclude that in sub-Saharan Africa the impact of adjustment on health was less important than more immediate and profound events such as the spread of HIV/AIDS and bouts of civil unrest.

In reviewing the literature, Anand and Chen (1996) came across studies suggesting that adjustment was associated with increases in infant mortality in Sao Paulo, Brazil, and Zambia, stagnation of infant mortality declines in Chile and increases in malnutrition in Ghana and Sri Lanka. They found, however, that these studies suffered from four shortcomings: the absence of effective linkages between macroeconomic change and health, the use of inappropriate health indicators, an exclusive focus on public sector provision of health services, and insufficient attention to the demand for and supply of health services by the private sector. They conclude that "the level of mortality may or may not rise in response to economic decline. Rather, reductions of the health stock are more likely to be reflected in stagnation or slowdown of the secular decline in mortality". Furthermore, it was unrealistic to expect an immediate impact on mortality trends. Rather, the impact may be reflected in subsequent mortality trends. Recent research suggests that government expenditures on health and education rose on average in countries undergoing structural adjustment and that there were no discernible differences in mortality trends between adjusting and non-adjusting countries (International Monetary Fund, 1998). Undoubtedly, the new round of adjustment programmes implemented during the Asian financial crisis of 1997-1998 will rekindle debate on this still unresolved issue.

2. *Countries with economies in transition*

Turning to the situation in Central and Eastern Europe, the reconfiguration of the Union of Soviet Socialist Republics into successor States and the momentous political, economic and social changes that swept across Eastern Europe have been accompanied by deteriorating health conditions. Many of these countries have exhibited striking demographic changes, as evidenced by declining fertility rates, stagnating or increasing mortality rates and declines in average life expectancy (United Nations, 1998). In marked contrast to the global pattern, increasing per capita income has been associated with increasing male mortality in the region.

A plethora of explanations have been offered for these mortality patterns. For example, according to the World Bank (1996), "Long-run stagnation in life expectancy in most countries, despite high and rising public spending for health, points to the ineffectiveness and inefficiency of many existing health services". Refuting the commonly held notion that the mortality crisis in the Russian Federation is due to the collapse of medical services or to environmental degradation Chen, Wittgenstein and McKeon (1996) claim that it is the result of a combination of historical and contemporary forces: catch-up effects from previous lifestyle risks, deferred deaths from the successful anti-alcohol campaign of the late 1980s, economic impoverishment, widening social inequality and the breakdown of political institutions. Leon and others (1997) conclude that the wide fluctuations in mortality rates observed in the Russian Federation between 1984 and 1994 resulted from very high alcohol consumption, combined with binge drinking.

3. *Developed market economies*

Among developed market economies, the potential detrimental impact of the prolonged economic downturn on morbidity and mortality has been examined. With the persistence of high unemployment in Western Europe, unemployment rates at the regional level have hovered between 9 and 11 per cent during the period 1992-1996 (United Nations Economic Commission for Europe, 1996), research has examined the implications of prolonged unemployment on mortality. According to some predictions, unemployment is likely to contribute to the premature death of large numbers of unemployed (Brenner, 1973). However, the data have not confirmed an association between unemployment and premature death (Martikainen and Valkonen, 1996). Paradoxically, mortality improvements in Finland have been faster during the current economic downturn than prior to it (Martikainen and Valkonen, 1995). Moreover, there is no conclusive evidence that unemployment contributes to unhealthy lifestyles, such as those marked by excessive alcohol consumption or the consumption of illicit drugs. However, unemployment does appear to have a detrimental impact on mental health (Lahelma, 1994).

One of the puzzling findings among developed countries is the impact of income inequality on health. There is ample evidence to suggest that further increases in gross national product (GNP) will not greatly improve life expectancy or other health indicators (Lundberg and Fritzell, 1994; Backlund, Sorlie and Johnson, 1996). Instead, some studies imply that narrowing income differentials will be one of the most effective means of improving health. Countries with little inequality and a low incidence of relative poverty also tend to have lower infant mortality and higher life expectancy (Lundberg and Fritzell, 1994). Recent data indicate, however, that socio-economic differences in adult mortality have widened in several countries (Valkonen, 1997). The evidence suggests that the relationship between mortality trends and poverty is more complex. In Finland, for example, socio-economic differentials in mortality have grown, while income inequalities have either narrowed or remained constant (Valkonen, 1997).

4. *Health And Environment*

A key intersection of health and development concerns has been the environment.[3] Safe drinking water, sanitation, atmospheric pollution, deforestation, desertification, depletion of the ozone layer and climatic change are actually or potentially major determinants of health. Despite dramatic improvements in the provision of fresh water supplies and basic sanitation in the last two decades, especially in rural areas of developing countries, provision has not kept pace with demand. It is estimated that as of 1994, 1.1 billion people lacked access to safe drinking water, while 2.9 billion were not served by adequate sanitation facilities (World Health Organization, 1997b).[4] Least developed countries are most at risk from traditional health hazards, including lack of safe water and sanitation, poor housing and shelter, unsafe food and high prevalence of disease vectors. Developing countries undergoing rapid industrialization are at risk from traditional as well as modern health hazards such as pollution, hazardous waste, unsafe pesticides and other chemicals, workplace hazards and traffic accidents. A further threat is posed by the potentially deleterious impact of global climate changes, including changes in the distribution of infectious and vector-borne diseases due to temperature changes. Recent assessments suggest that tropical diseases have an enormous potential to increase in epidemic form following modifications in patterns of land use for the purpose of increasing agricultural production (United Nations Development Programme/World Bank/World Health Organization, 1997). Poor environmental quality is linked to diarrhoeal diseases, respiratory infections and a variety of parasitic diseases as well as cardiovascular diseases and cancer (World Health Organization, 1997b).

C. Impact of Health on Development

Compared to the extensive body of literature on the impact of development on health, research on the consequences of health for development has been neglected. Little investigation has been undertaken since the 1980s, when a number of studies concluded that the linkages between health, productivity and income had not been established either because the results were inconclusive or because the methodology was flawed (Gwatkin, 1983; Andreano and Helminiak, 1988; Strauss, 1985). In a summary of the literature by Over and others (1992), it was concluded that the negative consequences of ill health may be difficult to ascertain empirically because, when confronted with illness, households and communities adopt coping strategies which reduce the costs of poor health. Coping might take the form of other family members' compensating for the lost labour of the sick or injured individual. Over and others (1992) suggest that the costs of coping are often extremely high, especially for future generations who must sacrifice their education to maintain household production and consumption.

Attempts to establish an association between health and productivity at the individual level have had more success. In Kenya and India, there is evidence linking nutrition, health and agricultural productivity (Deolalikar, 1988), while nutritional status of children is an important factor for school performance (Moock and Leslie, 1986; Jamison, 1986). In Brazil, health was found to influence wages. Using height and body mass as proxies for health, height had a large and significant impact on wages for men and women, while body mass was associated with higher wages for males (Thomas and Strauss, 1997). Drawing upon data from Indonesia and the United States, Dow and others (1997) found that as the cost of health-care rose, health outcomes worsened. The deleterious impact of higher prices for health-care spilled over to the labour market where higher prices were associated with reduced labour force participation and wages, particularly among poorer, older workers.

Ill health can also impact negatively on patterns of household consumption and investment. At the onset of illness, household disinvestment, dissaving and borrowing may be undertaken to finance medical care and maintain consumption patterns. In urban households in Bangladesh, expenditures on medical treatment were strongly correlated with the availability of assets. Once all assets were depleted, expenditures for medical treatment ceased (Pryer, 1989). In West African households afflicted by onchocerciasis (river blindness), assets such as bride-wealth were commonly used to finance medical care (Evans, 1989). In Thailand, 60 per cent of involuntary land sales were due to ill health (Corbett, 1988).

Diseases and epidemics that range across large swaths of territory can have significant impacts on development. Onchocerciasis control in Africa opened up vast new tracts to agriculture, making available 25 million hectares of previously infected arable land (World Health Organization, 1997a). The control of malaria and other endemic diseases has contributed to food and cash crop production in many areas formerly blighted by mosquito infestation. It has been estimated that Peru lost some US$ 500 million as a result of the cholera epidemic that raged across Peru in 1991 (300,000 reported cases and nearly 3,000 deaths by 1992). Losses were due to declines in exports, tourism, consumption and productivity (Petrera and Montoya, 1992).

Through its effects on national savings and productivity, HIV/AIDS may hamper economic growth in a number of developing countries. It is projected that among the 24 sub-Saharan countries with the highest HIV seroprevalence rates, the total population by 2005 will be 13 million less than it would have been without the epidemic (United Nations, 1998). Although less pervasive than other diseases (300 million to 500 million people are stricken annually with malaria, compared with about 30 million people believed to have become infected with HIV since the epidemic's onset), its economic impact has been especially devastating for two reasons: first, victims are often educated and skilled adults in their prime working years; and second, because of high treatment costs for HIV/AIDS — US$ 1,000 to US$ 1,500 a month per patient — resources are being diverted from other activities. Other, more-difficult-to-quantify costs are those incurred as a result of the growing population of "AIDS orphans" children whose parents have died of AIDS. Based on a study of seven countries (the Dominican Republic, Kenya, Rwanda, Thailand, Uganda, the United States and Zambia), it was estimated that there were more than 1 million children under 14 years of age who had been orphaned by AIDS within those seven countries (Joint and Co-sponsored United Nations Programme on HIV/AIDS,

1996). An earlier study based on 15 sub-Saharan African countries projected that by 1995, the number of maternal orphans (children under 10 years of age) resulting from AIDS would amount to 869,000 (United Nations, 1995b). It should be noted that even without the AIDS epidemic, a large number of children have become orphaned in sub-Saharan Africa. Projections indicate some 2 million non-AIDS-related maternal orphans in 1995.

For the 10 countries of sub-Saharan Africa most severely affected by AIDS, simulations based on varying assumptions imply a reduction in annual per capita income growth ranging from 0.6 to 1.5 percentage points (Over, 1992). More recent work in this area, however, suggests that while economic growth may be hampered, the impact will be smaller than originally thought and difficult to measure. (Much of the earlier work was based on assumptions that included a trend of unabated transmission of the AIDS virus). Some research suggests that the most serious economic consequences of AIDS are being felt among specific industries, occupations and geographical regions (Panos Institute, 1992). A recent study of 51 developed and developing countries concludes that AIDS has had an insignificant impact on overall economic growth (Bloom and Mahal, 1997).

A new perspective has emerged within the development dialogue, which positions health at the very heart of development. Recent decades have witnessed momentous changes in health and development, accompanied by mounting environmental stress at the global, regional and local levels. As with much of the research related to development, the findings concerning the interrelations between health and development are often inconclusive and few generalizations are possible. One finding that has emerged reveals that improvements in seemingly unrelated areas, such as poverty reduction and female education, can have beneficial side effects on health. While each region, country and locality confronts its own unique set of problems, there are many shared global and cross national problems to be addressed and these will require international cooperation, especially in the sphere of environmental degradation and control of infectious disease.

Notes

[1]For a discussion of poverty and the problems associated with its measurement, see *Report on the World Social Situation, 1997* (United Nations publication, Sales No. E.97.IV.1 and corrigendum).

[2]Among the proximate determinants that can be considered are income (level, distribution), education, fertility, public-health expenditures and political/economic structures. As regards possible health indicators, they include but are not limited to infant and child mortality, life expectancy, prevalence of low birth weight, nutritional status among children, and adult mortality and morbidity.

[3]For a discussion of Government perceptions concerning the impact of population on the environment, see *Government Views on the Relationships between Population and Environment* (United Nations publication, Sales No. E.98.XIII.7).

[4]For a discussion on the perils of collecting and evaluating data on access to adequate sanitation, see The *Progress of Nations, 1997* (UNICEF publication, Sales No. E.97.XX.USA.1).

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ANNEX TABLES

Health and Mortality

TABLE A.1. LIFE EXPECTANCY AT BIRTH, DEVELOPED COUNTRIES, 1970-1995
(*Years*)

Region and country	*Males*								
	1970-1975	*1975-1980*	*1980-1985*	*1985-1990*	*1991*	*1992*	*1993*	*1994*	*1995*
Asia									
Japan	70.6	72.8	74.2	75.4	76.1	76.1	76.3	76.6	76.4
Europe									
Eastern Europe									
Belarus	66.6	65.8	65.6	66.6	65.5	64.9	63.8	63.5	62.9
Bulgaria	68.7	68.7	68.5	68.4	..	67.7[a]	67.3[a]	..	..
Czech Republic	66.7	67.1	67.2	67.8	68.2	68.5	69.3	69.5	70.0
Hungary	66.5	66.3	65.3	65.5	65.0	64.6	64.5	64.8	65.3
Poland	67.0	67.0	67.0	66.9	66.1	..	67.4	..	..
Republic of Moldova	61.6	61.6	61.7	64.1	64.3	..	..	62.3	..
Romania	66.8	67.3	66.9	66.5	..	..	65.9[a]	65.7[a]	..
Russian Federation	63.1	61.9	62.1	64.3	63.5	62.0	58.9	57.6	58.3
Slovakia	66.8	66.9	66.8	67.1	..	..	68.4	68.3	68.4
Ukraine	65.3	64.2	64.5	65.8	..	63.5	62.8	..	..
Northern Europe									
Denmark	70.9	71.3	71.6	72.1	72.4[b]	72.5[b]	72.6[b]	..	..
Estonia	65.7	64.5	64.8	65.9	..	64.0	62.4	..	..
Finland	66.6	68.0	70.0	70.7	..	..	..	72.8	72.8
Iceland	71.4	73.4	73.9	75.3	75.7[b]	76.9[b]	..	76.5	..
Ireland	68.9	69.6	70.4	71.6	72.3[a]	..	..	..	..
Latvia	65.3	64.1	64.5	65.7	63.9	63.3	61.6	60.7	60.8
Lithuania	67.0	66.0	66.1	67.2	65.3	64.9	63.3	..	63.6
Norway	71.4	72.2	72.9	73.0	74.0	74.2	74.2	..	..
Sweden	72.1	72.3	73.4	74.3	74.9	75.4	75.5	76.1	..
United Kingdom	69.0	69.7	71.0	72.3	..	73.5	..	74.2	74.1
Southern Europe									
Albania	66.0	66.8	68.0	69.2	..	..	..	..	..
Bosnia and Herzegovina	65.2	67.4	68.0	69.2	..	..	..	..	..
Croatia	66.2	67.1	66.4	67.0	..	..	..	..	..
Greece	70.6	71.7	72.8	74.2	..	..	..	..	75.0
Italy	69.2	70.4	71.5	73.1	..	73.8	74.1	..	..
Malta	68.5	70.0	71.3	72.8	..	73.0	74.7	74.9	74.9
Portugal	64.9	66.7	68.8	70.1	..	..	71.2[b]	71.5[b]	..
Slovenia	66.0	67.0	66.9	67.5	..	..	69.6[b]	70.3[b]	..
Spain	70.2	71.4	72.8	73.1	..	..	..	..	..
TFYR Macedonia[c]	66.1	67.9	67.7	68.9	..	..	..		..
Yugoslavia	66.8	68.1	67.7	68.8	68.6	..	..	..	..
Western Europe									
Austria	67.0	68.5	69.6	71.6	72.6	72.9	73.0	73.3	73.5
Belgium	68.2	69.1	70.4	72.0	..	..	..	..	..
France	68.6	69.7	70.8	72.0	72.9	72.9	73.3	..	..
Germany	67.9	69.0	70.3	71.7	..	72.5[a]	72.8[a]	73.0[a]	..
Luxembourg	67.2	68.2	70.2	70.9	..	..	..	..	..
Netherlands	71.1	72.1	72.8	73.6	74.2[a]	74.2[b]	74.2[b]	74.6[b]	..
Switzerland	70.8	72.0	72.9	74.0	..	74.7[b]	75.1[b]	75.3[b]	..
Northern America									
Canada	69.7	70.5	72.4	73.4	..	74.6	..	..	..
United States of America	67.5	69.4	70.9	71.6	72.0	..	72.2	72.4	..
Oceania									
Australia	68.4	70.1	71.9	73.0	74.4	75.0	75.0	75.0	..
New Zealand	68.7	69.3	70.7	71.5	72.9[a]	..	73.4[a]	..	..

TABLE A.1 (*continued*)

Region and country	Females								
	1970-1975	*1975-1980*	*1980-1985*	*1985-1990*	*1991*	*1992*	*1993*	*1994*	*1995*
Asia									
Japan	76.2	78.2	79.7	81.2	82.1	82.2	82.5	83.0	82.9
Europe									
Eastern Europe									
Belarus	75.5	75.5	75.2	75.6	75.5	75.5	74.4	74.3	74.3
Bulgaria	73.9	74.1	74.3	74.7	74.4[a]	74.9[a]	..	..	
Czech Republic	73.5	74.2	74.3	75.2	75.7	76.1	76.4	76.6	77.0
Hungary	72.4	72.8	73.0	73.6	73.8	73.7	73.8	74.2	74.5
Poland	74.1	75.0	75.0	75.4	75.3	..	76.0	..	..
Republic of Moldova	68.5	68.5	68.3	70.7	71.0	..	..	69.8	..
Romania	71.3	72.0	72.6	72.6	73.2	..	73.3[a]	73.4[a]	..
Russian Federation	73.5	73.1	73.4	74.3	74.3	73.8	71.9	71.2	71.7
Slovakia	73.5	74.2	74.7	75.2	..	..	76.7	76.5	76.3
Ukraine	74.0	73.7	73.8	74.5	..	73.7	73.2	..	..
Northern Europe									
Denmark	76.4	77.3	77.6	77.9	77.8[b]	77.8[b]	77.8[b]	..	..
Estonia	74.6	74.4	74.5	75.0	..	75.0	73.9	..	..
Finland	75.0	76.6	77.9	78.8	..	..	..	80.2	80.2
Iceland	77.4	79.3	79.8	80.3	80.9[b]	80.8[b]	80.6[b]	..	..
Ireland	73.8	74.6	75.9	77.3	77.9[a]	..	..	..	..
Latvia	74.5	74.1	74.2	74.9	74.8	74.8	73.8	72.9	73.0
Lithuania	75.4	75.4	75.7	76.4	76.1	76.0	75.0	..	75.2
Norway	77.6	78.6	79.5	79.8	80.1	80.3	80.3	..	..
Sweden	77.5	78.3	79.3	80.3	80.5	80.8	80.8	81.4	..
United Kingdom	75.2	76.0	77.2	77.9	..	79.1	..	79.4	79.3
Southern Europe									
Albania	69.5	71.2	73.0	75.0	..	..	..	..	..
Bosnia and Herzegovina	69.5	72.1	73.4	74.5	..	..	..	..	..
Croatia	72.9	74.1	74.6	75.5	..	..	..	..	..
Greece	74.2	75.8	77.5	79.4	..	..	..	..	80.2
Italy	75.2	76.9	78.0	79.6	..	80.4	80.5	..	..
Malta	72.8	74.3	75.8	77.3	..	77.8	78.6	79.1	79.5
Portugal	71.3	73.8	75.8	77.2	..	78.0[b]	78.2[b]	78.6[b]	..
Slovenia	73.5	74.8	75.5	76.8	..	..	77.4[b]	77.8[b]	..
Spain	75.7	77.4	78.9	80.0	..	..	..	..	..
TFYR Macedonia[c]	68.9	71.4	71.5	72.9	..	..	..	..	..
Yugoslavia	70.6	72.5	72.7	73.7	74.4	..	..	..	..
Western Europe									
Austria	74.3	75.7	76.8	78.3	79.2	79.4	79.4	79.7	80.1
Belgium	74.7	75.7	77.2	78.6	..	..	..	..	..
France	76.3	77.8	78.9	80.3	81.1	81.2	81.4	..	..
Germany	73.8	75.5	76.8	78.2	..	79.0[a]	79.3[a]	79.5[a]	..
Luxembourg	74.4	75.3	77.1	78.3	..	..	..	..	..
Netherlands	77.0	78.6	79.4	80.0	80.2[b]	80.2[b]	80.0[b]	80.4[b]	..
Switzerland	77.0	78.6	79.6	80.7	..	81.4[b]	81.6[b]	81.7[b]	..
Northern America									
Canada	76.8	78.1	79.6	80.2	..	80.9	..	..	..
United States	75.3	77.2	78.3	78.5	78.9	..	78.8	79.0	..
Oceania									
Australia	75.2	77.0	78.7	79.4	80.3	80.4	80.9	80.9	..
New Zealand	74.8	75.7	76.9	77.7	78.7[a]	..	79.1[a]	..	..

Sources: 1970-1990: *United Nations, World Population Prospects: The 1996 Revision* (United Nations. Sales No. E.98.XIII.5); 1991-1995: data supplied by the United Nations Statistics Division.

[a]Data are for a three-year period centred on the year shown in the column heading.

[b]Data are for a two-year period, with the first year corresponding to the year shown in the column heading.

[c]The former Yugoslav Republic of Macedonia.

TABLE A.2. INFANT MORTALITY, 1970-1995; UNDER-FIVE MORTALITY 1990-1995; AND PERCENTAGE CHANGE IN INFANT MORTALITY, 1970-1995, FOR MAJOR AREAS AND REGIONS

Major area or region	*Infant mortality (per 1,000 live births)*					*Percentage change in infant mortality*	*Under-five mortality (per 1,000 live births)*
	1970-1975	*1975-1980*	*1980-1985*	*1985-1990*	*1990-1995*	*1970-1995*	*1990-1995*
World	93	87	78	69	62	-33	82
More developed regions	21	18	15	13	11	-50	13
Less developed regions	104	98	87	76	68	-35	90
Least developed countries	147	139	130	118	109	-26	156
Africa	130	120	112	100	94	-28	145
Eastern Africa	137	129	125	114	108	-22	164
Middle Africa	135	123	113	104	97	-28	149
Northern Africa	132	115	100	77	67	-49	86
Southern Africa	81	76	66	60	55	-32	87
Western Africa	129	120	113	104	98	-24	164
Asia	98	94	83	72	62	-37	77
Eastern Asia	56	48	48	47	41	-27	44
South-central Asia	132	127	107	92	78	-41	102
South-eastern Asia	101	91	78	66	54	-47	70
Western Asia	111	94	79	63	60	-46	75
Europe	25	22	18	15	13	-48	16
Eastern Europe	28	27	23	21	19	-31	23
Northern Europe	16	13	10	9	7	-55	9
Southern Europe	31	23	18	14	11	-64	15
Western Europe	18	13	10	8	7	-63	8
Latin America and the Caribbean	80	68	56	47	40	-50	46
Caribbean	72	64	57	49	43	-40	55
Central America	74	62	52	43	37	-51	46
South America	84	72	58	48	41	-51	45
Northern America	18	14	11	10	9	-52	10
Oceania	41	35	30	28	26	-36	33
Australia/New Zealand	17	13	10	9	7	-58	9
Melanesia	89	69	63	61	59	-34	76
Micronesia	72	65	57	50	41	-43	52
Polynesia	84	74	55	44	35	-58	43

Source: *World Population Prospects: The 1996 Revision*, (United Nations publication, Sales No. E.98.XIII.5), annex I: Demographic indicators.

TABLE A.3. ESTIMATES OF INFANT AND UNDER-FIVE MORTALITY FOR AFRICAN COUNTRIES, 1970-1995

Country or area	Approximate date of estimate						Period	Percentage change	Annual rate of change
	1970	1975	1980	1985	1990	1995			
	A. Infant mortality (per 1,000)								
Eastern Africa									
Burundi	139	..	111	113	..	..	1969-1984	-19	-1.4
Comoros	129	110	..	106	90	77	1969-1994	-40	-2.1
Djibouti	..	..	136	..	..	..	..	..	..
Eritrea	..	..	..	106	97	86	1984-1994	-19	-2.1
Ethiopia	..	..	..	122	..	..	..	..	..
Kenya	100	86	69	63	62	..	1970-1990	-38	-2.4
Madagascar	104	91	104	113	93	..	1970-1990	-11	-0.6
Malawi	194	176	155	138	134	..	1970-1990	-31	-1.9
Mauritius	59	49	24	24	21	20	1972-1995	-66	-4.7
Mozambique	164	164	..	..	..	..	1969-1975	0	0.0
Rwanda	124	131	129	123	113	..	1969-1990	-9	-0.4
Uganda	..	..	114	121	..	..	1980-1984	6	1.5
United Republic of Tanzania	134	..	108	..	98	..	1969-1989	-27	-1.6
Zambia	105	105	95	99	107	..	1970-1989	2	0.1
Zimbabwe	..	76	71	56	55		1975-1990	-28	-2.2
Middle Africa									
Cameroon	127	116	106	92	81	..	1971-1990	-36	-2.4
Central African Republic	148	..	..	113	107	..	1970-1992	-28	-1.5
Congo	99	..	..	..	..	..	..	..	..
Democratic Republic of the Congo (formerly Zaire)	147	136	127	..	..	..	1970-1979	-14	-1.6
Northern Africa									
Algeria	146	..	103	78	..	..	1970-1985	-47	-4.2
Egypt	160	134	117	97	62		1970-1990	-61	-4.8
Libyan Arab Jamahiriya	120	..	..	..	..	..	..	..	..
Morocco	127	112	100	72	61	..	1969-1989	-52	-3.7
Sudan	121	..	97	..	..	..	1968-1980	-20	-1.8
Tunisia	129	120	70	50	49	..	1970-1987	-62	-5.7
Southern Africa									
Botswana	103	90	71	58	49	..	1969-1989	-52	-3.7
Lesotho	133	119	..	96		..	1969-1983	-28	-2.3
Namibia	..	..	72	67	68	..	1979-1988	-6	-0.6
South Africa	..	69	62	..	..	..	1975-1980	-11	-2.1
Swaziland	134	..	..	..	..	..	..	..	..
Western Africa									
Benin	154	135	116	106	101	..	1970-1988	-34	-2.3
Burkina Faso	162	154	140	132	128	..	1970-1988	-21	-0.1
Côte d'Ivoire	..	133	..	94	89	..	1975-1992	-33	-2.4
Ghana	115	102	90	84		..	1969-1986	-27	-1.9
Guinea	..	..	..	151	150	..	1983-1989	-1	-0.1
Liberia	184	164	..	151	..	..	1967-1984	-18	-1.2
Mali	..	189	173	..	..	..	1975-1980	-8	-1.8

TABLE A.3 (*continued*)

Country or area	Approximate date of estimate 1970	1975	1980	1985	1990	1995	Period	Percentage change	Annual rate of change
Mauritania	..	146	132	..	..	..	1972-1977	-10	-2.0
Niger	..	..	..	146	..	..	..	..	..
Nigeria	110	99	96	87	..	..	1969-1987	-21	-1.3
Senegal	122	112	90	84	68	..	1970-1990	-44	-2.9
Sierra Leone	213	198	191	..	..	..	1969-1980	-10	-1.0
Togo	130	107	105	100	..	..	1968-1984	-23	-1.6
B. *Under-five mortality (per 1,000)*									
Eastern Africa									
Burundi	235	..	186	188	..	..	1969-1984	-20	-1.5
Comoros	191	159		143	122	104	1969-1994	-46	-2.4
Djibouti	..	..	202	..	..	..	..	..	..
Eritrea	..	..	..	176	158	139	1984-1994	-21	-2.4
Ethiopia	..	..	..	205	..	..	..	..	..
Kenya	164	138	102	90	96	..	1970-1990	-41	-2.7
Madagascar	170	169	181	195	163	..	1970-1990	-4	-0.2
Malawi	341	306	261	246	234	..	1970-1990	-31	-1.9
Mauritius	82	..	30	..	..	..	1972-1983	-63	-9.2
Mozambique	281	281	..	..	..	..	1969-1975	0	0.0
Rwanda	210	222	218	207	188	..	1969-1990	-10	-0.5
Uganda	..	..	200	203	..	..	1980-1984	2	0.4
United Republic of Tanzania	226	..	179	..	160	..	1969-1989	-29	-1.7
Zambia	173	174	155	162	191	..	1970-1989	10	0.5
Zimbabwe	..	121	112	85	83	..	1975-1990	-31	-2.5
Middle Africa									
Cameroon	214	194	176	150	128	..	1971-1990	-40	-2.7
Central African Republic	245	..	..	189	160	..	1970-1992	-35	-1.9
Congo	144	..	..	..	..	..	..	..	..
Democratic Republic of the Congo (formerly Zaire)	243	220	200	..	..	..	1970-1979	-18	-2.2
Northern Africa									
Algeria	219	..	152	97	..	..	1970-1985	-56	-5.4
Egypt	240	216	171	130	85	..	1970-1990	-65	-5.2
Libyan Arab Jamahiriya	187	..	..	..	..	..	..	..	..
Morocco	201	171	146	114	93	..	1969-1989	-54	-3.9
Sudan	203	..	158	..	..	..	1968-1980	-22	-2.1
Tunisia	191	177	96	65	64	..	1970-1987	-66	-6.4
Southern Africa									
Botswana	152	126	92	73	59	..	1969-1989	-61	-4.7
Lesotho	185	175	..	137		..	1969-1983	-26	-2.2
Namibia	..	..	110	102	93	..	1979-1988	-15	-1.9
South Africa	..	..	..	..	..	..	..	..	..
Swaziland	215	..	..	..	..	..	..	..	..

TABLE A.3 (*continued*)

Country or area	Approximate date of estimate 1970	1975	1980	1985	1990	1995	Period	Percentage change	Annual rate of change
Western Africa									
Benin	261	227	193	174	166	..	1970-1988	-36	-2.5
Burkina Faso	275	259	229	212	204	..	1970-1988	-26	-1.7
Côte d'Ivoire	..	197	..	150	150	..	1975-1992	-24	-1.6
Ghana	192	167	146	135	..	..	1969-1986	-30	-2.1
Guinea	..	..	..	256	254	..	1983-1989	-1	-0.1
Liberia	275	243	..	226	..	..	1967-1984	-18	-1.2
Mali	..	331	299		..	..	1975-1980	-10	-2.0
Mauritania	..	238	191		..	..	1972-1977	-20	-4.4
Niger	..	..	..	334	..	..	..	..	..
Nigeria	205	201	189	192	..	..	1969-1987	-6	-0.4
Senegal	283	262	199	185	131	..	1970-1990	-54	-3.9
Sierra Leone	377	348	334	..	..	..	1969-1980	-11	-1.1
Togo	219	206	173	164	..	..	1968-1984	-25	-1.8

Source: United Nations, database on mortality in childhood: Africa (POP/1B/DB/97/1), maintained by the Population Division of the United Nations Secretariat (1997).

TABLE A.4. ESTIMATES OF INFANT AND UNDER-FIVE MORTALITY FOR ASIAN COUNTRIES, 1970-1995

Country or area	Approximate date of estimate 1970	1975	1980	1985	1990	1995	Period	Percentage change	Annual rate of change
				A. *Infant mortality (per 1,000)*					
Eastern Asia									
China	81	63	49	38	33	..	1970-1988	-59	-5.0
Hong Kong, China	20	14	10	8	6	5	1971-1995	-75	-5.8
Republic of Korea	48	28	15	..	10	..	1969-1991	-79	-7.1
South-central Asia									
Afghanistan	223	..	..	..	..	..	..	..	..
Bangladesh	149	147	132	112	108	..	1969-1989	-28	-1.6
Bhutan	154	139	130	..	..	..	1969-1980	-16	-1.5
India	129	126	117	101	87	..	1971-1988	-33	-2.3
Iran (Islamic Republic of)	136	112	86	70	..	..	1971-1984	-49	-5.1
Kazakhstan	26	39	33	30	26	28	1970-1995	8	0.3
Kyrgyzstan	45	43	43	42	30	28	1970-1995	-38	-1.9
Nepal	156	141	120	108	102	..	1969-1989	-35	-2.1
Pakistan	119	114	106	..	100	..	1966-1988	-16	-0.8
Sri Lanka	62	48	30	26	..	..	1970-1984	-58	-6.2
Tajikistan	46	57	54	52	45	42	1970-1994	-9	-0.4
Turkmenistan	31	54	47	45	35	..	1970-1990	13	0.6
Uzbekistan	46	81	58	47	41	29	1970-1994	-37	-1.9
South-eastern Asia									
Indonesia	..	96	80	75	71	..	1974-1988	-26	-2.2
Lao People's Democratic Republic	..	..	..	125	119	..	1984-1989	-5	-1.0
Malaysia	41	32	26	17	13	10	1970-1996	-76	-5.4
Myanmar	121	108	102	96	103	..	1968-1988	-15	-0.8
Philippines		58	51	48	34	..	1975-1990	-41	-3.6
Singapore	20	14	12	9	7	4	1970-1996	-80	-6.2
Thailand	76	63	47	35	29	..	1969-1988	-62	-5.1
Viet Nam	..	..	55	46	44	..	1981-1991	-20	-2.2
Western Asia									
Armenia	25	31	26	25	19	15	1970-1994	-40	-2.1
Azerbaijan	35	38	30	29	26	..	1970-1989	-26	-1.5
Georgia	25	33	25	24	20	..	1970-1989	-20	-1.1
Iraq	84	78	68	52	..	..	1969-1986	-38	-2.8
Israel	24	23	15	12	10	8	1970-1993	-67	-4.8
Jordan	82	66	47	36	..	..	1970-1985	-56	-5.5
Kuwait	49	36	26	24	..		1969-1984	-51	-4.8
Syrian Arab Republic	89	69	56	42	..	..	1970-1984	-53	-5.4
Turkey	147	132	110	86	79	..	1969-1988	-46	-3.3
United Arab Emirates	57	35	..	24	..	..	1972-1986	-58	-6.2
				B. *Under-five mortality (per 1,000)*					
Eastern Asia									
China	116	87	65	48	42	..	1970-1988	-64	-5.7

TABLE A.4 (*continued*)

Country or area	Approximate date of estimate 1970	1975	1980	1985	1990	1995	Period	Percentage change	Annual rate of change
Hong Kong, China	32	17	12	9	8	..	1971-1990	-75	-7.3
Republic of Korea	62	34	17	..	13	..	1969-1991	-79	-7.1
South-central Asia									
Afghanistan	332	..	..	..	..	..	..	..	..
Bangladesh	244	240	187	164	166	..	1969-1989	-32	-1.9
Bhutan	260	234	219	..	..	..	1969-1980	-16	-1.6
India	..	..	184	153	128	..	1979-1988	-30	-4.0
Iran (Islamic Republic of)	215	170	125	99	..	..	1971-1984	-54	-6.0
Kazakhstan	..	..	..	..	..	..	..	..	..
Kyrgyzstan	..	..	..	..	..	..	..	..	..
Nepal	227	206	176	157	148	..	1969-1989	-35	-2.1
Pakistan	187	178	163	..	152	..	1966-1988	-19	-0.9
Sri Lanka	85	63	41	32	..	..	1970-1984	-62	-7.0
Tajikistan	..	..	..	..	..	..	..	..	..
Turkmenistan	..	..	..	..	..	..	..	..	..
Uzbekistan	..	..	..	..	..	..	..	..	..
South-eastern Asia							..	..	..
Indonesia	..	157	127	119	112	..	1974-1988	-29	-2.4
Lao People's Democratic Republic	..	..	..	185	175	..	1984-1989	-5	-1.1
Malaysia	58	44	35	23	17	..	1970-1989	-71	-6.5
Myanmar	178	157	141	127	147	..	1968-1988	-17	-1.0
Philippines	..	93	79	71	54	..	1975-1990	-42	-3.6
Singapore	26	..	15	..	..	..	1970-1980	-42	-5.5
Thailand	106	86	60	45	35	..	1969-1988	-67	-5.8
Viet Nam	..	..	82	55	55	..	1981-1991	-33	-4.0
Western Asia									
Armenia	..	..	..	..	..	..	..	..	..
Azerbaijan	..	..	..	..	..	..	..	..	..
Georgia	..	..	..	..	..	..	..	..	..
Iraq	119	109	93	68	..	..	1969-1986	-43	-3.3
Israel	27	27	18	14	12	..	1970-1988	-56	-4.5
Jordan	116	91	60	44	..	..	1970-1985	-62	-6.5
Kuwait	64	43	32	29	..	..	1969-1984	-55	-5.3
Syrian Arab Republic	126	95	75	53	..	..	1970-1984	-58	-6.2
Turkey	197	175	144	109	99	..	1969-1988	-50	-3.6
United Arab Emirates	76	43	..	29	..	..	1972-1986	-62	-6.9

Source: United Nations database on mortality in childhood: Asia (POP/1B/DB/97/2), maintained by the Population Division of the United Nations Secretariat (1997).

TABLE A.5. ESTIMATES OF INFANT AND UNDER-FIVE MORTALITY FOR COUNTRIES IN LATIN AMERICA AND THE CARIBBEAN, 1970-1995

Country or area	Approximate date of estimate 1970	1975	1980	1985	1990	1995	Period	Percentage change	Annual rate of change
				A. *Infant mortality (per 1,000)*					
Caribbean									
Cuba	41	27	18	15	..	8	1970-1996	-80	-6.3
Dominican Republic	98	87	77	57	..	..	1969-1985	42	-3.4
Haiti	162	153	132	109	105	..	1969-1988	35	-2.3
Jamaica	..	40	..	17	..	..	1975-1986	58	-7.8
Puerto Rico	29	..	19	..	16	11	1970-1994	-62	-4.0
Trinidad and Tobago	50	44	37	26	..	..	1971-1984	48	-5.0
Central America									
Costa Rica	58	38	28	18	15	13	1969-1994	-78	-6.0
El Salvador	109	..	84	60	57	..	1970-1990	48	-3.2
Guatemala	117	..	100	74	..	..	1970-1984	37	-3.3
Honduras	..	89	73	55	50	..	1973-1989	44	-3.6
Mexico	82	69	59	43	39	..	1970-1988	52	-4.1
Nicaragua	..	96	88	..	63	..	1975-1990	34	-2.8
Panama	50	42	31	30	27	..	1970-1989	46	-3.2
South America									
Argentina	60	43	36	26	26	22	1970-1995	-63	-4.0
Bolivia	148	127	116	100	91	..	1969-1990	39	-2.6
Brazil	97	92	..	68	..	..	1969-1983	30	-2.5
Chile	82	58	32	19	16	11	1969-1995	-87	-7.7
Colombia	72	57	39	34	28	..	1969-1992	61	-4.1
Ecuador	108	89	75	51	39	..	1970-1989	64	-5.4
Paraguay	58	53	51	..	..	..	1969-1980	12	-1.2
Peru	115	108	92	78	61	..	1970-1989	47	-3.3
Uruguay	50	47	38	29	21	20	1970-1995	-60	-3.7
Venezuela	53	43	33	32	24	..	1970-1990	55	-4.0
				B. *Under-five mortality (per 1,000)*					
Caribbean									
Cuba	46	..	23	19	..	..	1970-1985	-59	-5.9
Dominican Republic	142	120	101	71	..	..	1969-1985	-50	-4.3
Haiti	242	230	195	158	152	..	1969-1988	-37	-2.5
Jamaica	..	51	..	20	..	..	1975-1986	-61	-8.5
Puerto Rico	32	..	21	..	18	..	1970-1990	-44	-2.9
Trinidad and Tobago	59	51	41	30	..	..	1971-1984	-49	-5.2
Central America									
Costa Rica	77	..	34	..	..	..	1969-1980	-56	-7.4
El Salvador	158	..	119	82	76	..	1970-1990	-52	-3.7
Guatemala	171	..	144	103	..	..	1970-1984	-40	-3.6
Honduras	..	126	101	74	65	..	1973-1989	-48	-4.1
Mexico	115	95	79	55	48	..	1970-1988	-58	-4.9

TABLE A.5 (*continued*)

Country or area	Approximate date of estimate 1970	1975	1980	1985	1990	1995	Period	Percentage change	Annual rate of change
Nicaragua	..	138	124	..	86	..	1975-1990	-38	-3.2
Panama	79	61	44	40	36	..	1970-1989	-54	-4.1
South America									
Argentina	69	..	42	..	..	..	1970-1980	-39	-5.0
Bolivia	246	201	178	146	127	..	1969-1990	-48	-3.5
Brazil	140	129	..	87	..	..	1969-1983	-38	-3.4
Chile	96	..	43	..	..	..	1969-1980	-55	-7.3
Colombia	113	86	54	47	36	..	1969-1992	-68	-5.0
Ecuador	156	127	105	67	49	..	1970-1989	-69	-6.1
Paraguay	78	70	67	..	..	..	1969-1980	-14	-1.4
Peru	177	161	130	103	77	..	1970-1989	-56	-4.4
Uruguay	..	52	44	33	..	..	1975-1985	-37	-4.6
Venezuela	71	55	41	39	..	..	1970-1984	-45	-4.3

Source: United Nations database on mortality in childhood: Latin America and the Caribbean (POP/1B/DB/97/3), maintained by the Population Division of the United Nations Secretariat (1997).

TABLE A.6. ESTIMATES OF INFANT MORTALITY, DEVELOPED COUNTRIES, 1970-1996

	Infant mortality (per 1,000)							Percentage change[a]
	1970	1975	1980	1985	1990	1995	1996	1970-1995
Europe								
Eastern Europe								
Belarus	19	19	16	15	12	13	13	-32
Bulgaria	27	23	20	15	15	15	..	-44
Czech Republic	..	..	12	11	7	6	6	-51
Hungary	36	33	23	20	15	11	11	-70
Poland	33	25	21	18	19	14	12	-59
Republic of Moldova	23	45	35	31	19	22	20	-4
Romania	49	35	29	26	27	21	..	-57
Russian Federation	23	24	22	21	18	18	..	-22
Slovakia	..	..		16	12	11	10	-31
Ukraine	17	20	17	16	13	15	15	-12
Northern Europe								
Denmark	14	10	8	8	7	5	6	-64
Estonia	18	18	17	14	12	15	11	-17
Finland	13	10	8	6	6	4	..	-70
Ireland	20	18	11	9	8	6	6	-68
Latvia	18	20	15	13	14	19	16	6
Lithuania	19	20	15	14	10	13	10	-32
Norway	13	11	8	8	7	4		-69
Sweden	11	9	7	7	6	5	3	-56
United Kingdom	18	16	12	9	8	6	6	-66
Southern Europe								
Albania	..	..	..	30	28	..	..	-6
Bosnia and Herzegovina	..	..	..	..	15	..	..	..
Croatia	..	..	21	17	11	9	..	-56
Greece	30	24	18	14	10	8	8	-73
Italy	30	21	15	11	9	6	6	-80
Portugal	58	39	24	18	11	8	7	-87
Slovenia	..	..	..	13	8	6	5	-57
Spain	27	19	12	9	8	6	5	-79
The former Yugoslav Republic of Macedonia	..	..	54	43	32	23	..	-58
Yugoslavia	..	..	..	33	23	16	14	-50
Western Europe								
Austria	26	21	14	11	8	5	5	-79
Belgium	21	16	12	9	8	6	6	-71
France	18	14	10	8	7	5	5	-74
Germany	..	..	12	9	7	5	..	-57
Netherlands	12	11	9	8	7	5	5	-54
Switzerland	15	11	9	7	7	5	5	-66

TABLE A.6 (*continued*)

	Infant mortality (per 1,000)							*Percentage change*[a]
	1970	*1975*	*1980*	*1985*	*1990*	*1995*	*1996*	*1970-1995*
Northern America								
Canada	19	14	10	8	7	6	..	-68
United States of America . .	20	16	13	11	9	8	..	-62
Oceania								
Australia	18	14	11	10	8	6	..	-69
New Zealand	17	16	13	11	8	7	..	-61
Asia								
Japan	13	10	8	6	5	4	..	-67

Sources: United Nations Statistics Division and Vladimir Shkolnikov (1994), "Life expectancy and causes of death in Russia: the overview of trends in 1970-1992", 1994 (mimeograph).

[a]Percentage change calculated from earliest year to 1995 or to most recent year of estimate when estimate for 1995 was not available.

TABLE A.7. ESTIMATES OF INFANT, CHILD AND UNDER-FIVE MORTALITY, BY SEX; AND SEX RATIOS OF INFANT, CHILD AND UNDER-FIVE MORTALITY, BY COUNTRY AND REFERENCE DATE, AFRICA

		Infant mortality (per 1,000)			*Child mortality (per 1,000)*			*Under-five mortality (per 1,000)*			*Sex ratio (per 100)*		
Country or area	*Reference date*	*Male*	*Female*	*Both sexes*	*Male*	*Female*	*Both sexes*	*Male*	*Female*	*Both sexes*	*Infant mortality*	*Child mortality*	*Under-five mortality*
Eastern Africa													
Burundi	1982	126	100	113	74	96	85	190	186	188	126	77	102
Ethiopia	1974	..	..	..	..	..	..	226	204	215	..	..	111
	1982	..	..	..	..	..	..	231	168	200	..	..	138
Kenya	1973	96	86	91	66	59	63	155	140	148	112	112	111
	1985	65	56	61	36	35	35	99	89	94	116	103	111
Madagascar	1987	100	100	100	73	69	71	166	162	164	100	106	102
Malawi	1975	..	..	..	..	..	..	317	309	313	..	..	103
	1987	140	129	135	99	91	95	225	208	217	109	109	108
Mauritius	1975	57	45	51	16	17	17	72	62	67	127	94	116
	1985	27	21	24	4.3	3.9	4	31	25	28	129	110	124
Mozambique	1982	..	..	..	..	..	..	284	275	280	..	..	103
Rwanda	1973	140	123	132	108	102	105	233	213	223	114	106	109
	1987	142	119	131	111	93	102	238	201	220	119	119	118
Uganda	1983	113	104	109	86	75	81	190	172	181	109	115	110
United Republic of Tanzania	1978	124	109	117	92	87	89	205	186	196	114	106	110
	1983	115	105	110	85	79	82	190	175	183	110	108	109
Zambia	1973	..	..	..	..	..	..	179	171	175	..	..	105
	1987	117	99	108	82	77	80	189	169	179	118	106	112
Middle Africa													
Cameroon	1973	126	116	121	92	96	94	207	200	204	109	96	104
	1985	97	85	91	57	69	63	148	147	148	114	83	101
Central African Republic	1990	100	87	94	40	44	42	137	127	132	115	91	108
Congo	1975	89	81	85	38	38	38	124	116	120	110	100	107
	1983	73	63	68	26	27	27	97	89	93	116	96	109
Zimbabwe	1975	..	..	..	..	..	..	127	113	120	..	..	112
	1985	63	49	56	29	30	30	90	77	84	129	97	117
Southern Africa													
Botswana	1982	60	43	52	17	17	17	76	60	68	140	100	127
Lesotho	1972	129	120	125	75	59	67	195	172	184	108	127	113
Namibia	1987	75	64	70	18	25	22	92	87	90	117	72	106
South Africa	1987	50	40	45	24	22	23	72	61	67	125	109	118
Western Africa													
Benin	1975	143	127	135	111	104	108	238	218	228	113	107	109
Burkina Faso	1985	128	111	120	71	79	75	190	182	186	115	90	104
Côte d'Ivoire	1975	145	117	131	73	72	72	207	181	194	124	101	114
	1985	89	75	82	40	34	37	126	106	116	119	118	119
Ghana	1975	113	92	103	75	73	74	179	158	169	123	103	113
	1985	108	92	100	70	70	70	170	156	163	117	100	109

TABLE A.7 (*continued*)

Country or area	Reference date	Infant mortality (per 1,000) Male	Female	Both sexes	Child mortality (per 1,000) Male	Female	Both sexes	Under-five mortality (per 1,000) Male	Female	Both sexes	Sex ratio (per 100) Infant mortality	Child mortality	Under-five mortality
Liberia	1970	187	168	178	109	105	107	276	256	266	111	104	108
	1980	174	137	156	90	92	91	248	217	233	127	98	114
Mali	1982	167	148	158	127	130	128	273	259	266	113	98	105
Mauritania	1975	114	104	109	64	66	65	170	164	167	110	97	104
	1983	95	76	86	59	57	58	149	129	139	125	104	116
Niger	1987	193	189	191	148	171	159	313	328	320	102	87	95
Nigeria	1975	128	108	118	91	90	91	207	188	198	119	101	110
	1985	119	113	116	94	80	87	202	184	193	105	117	110
Senegal	1973	171	148	160	127	137	132	277	265	271	116	93	105
	1985	119	102	111	84	81	82	193	175	184	117	104	110
Togo	1983	109	94	102	65	80	72	167	167	167	116	81	100
Northern Africa													
Algeria	1975	113	109	111	62	67	64	168	168	168	104	93	100
	1985	84	81	83	32	34	33	113	113	113	104	94	100
Egypt	1975	139	139	139	70	90	80	200	217	208	100	78	92
	1985	93	89	91	38	46	42	127	131	129	104	83	97
Libyan Arab Jamahiriya	1975	101	99	100	50	53	51	146	146	146	102	94	100
Morocco	1972	122	111	117	69	77	72	183	179	181	110	90	102
	1985	83	75	79	28	31	29	109	103	106	111	90	106
Tunisia	1975	101	95	98	45	48	47	141	139	140	106	94	101
	1983	66	60	63	25	25	25	89	83	86	110	100	107
Sudan	1973	109	91	100	69	71	70	170	156	163	120	97	109
	1985	81	69	75	48	45	46	125	111	118	117	107	113

Source: United Nations database on mortality in childhood by sex: Africa (POP/1B/DB/95/1), maintained by the Population Division of the United Nations Secretariat (1995).

TABLE A.8. ESTIMATES OF INFANT, CHILD AND UNDER-FIVE MORTALITY, BY SEX; AND SEX RATIOS OF INFANT, CHILD AND UNDER-FIVE MORTALITY, BY COUNTRY AND REFERENCE DATE, ASIA

Country or area	Reference date	Infant mortality (per 1,000)			Child mortality (per 1,000)			Under-five mortality (per 1,000)			Sex ratio (per 100)		
		Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Infant mortality	Child mortality	Under-five mortality
Western Asia													
Israel	1975	24	20	22	4.3	3.9	4	28	24	26	120	110	117
	1985	13	11	12	2.1	2.0	2	15	13	14	118	105	115
Iraq	1973	86	77	82	38	34	36	121	109	115	112	112	111
	1980	..	..	..	..	..	..	97	87	92	..	..	111
Jordan	1970	76	81	78	33	34	34	106	112	109	94	97	95
	1985	39	41	40	10.5	10.3	10	49	51	50	95	102	96
Kuwait	1975	39	33	36	8.5	8.1	8	47	41	44	118	105	115
	1983	25	21	23	5.8	4.5	5	31	25	28	119	129	124
Oman	1978	78	66	72	29	40	34	105	103	104	118	73	102
Saudi Arabia	1980	..	..	..	..	..	..	89	76	83	..	..	117
Syrian Arab Republic	1972	80	80	80	33	39	36	111	116	113	100	85	96
	1982	..	..	..	..	..	..	68	60	64	..	..	113
Turkey	1973	147	135	141	47	60	54	187	187	187	109	78	100
	1988	91	75	83	25	23	24	113	96	105	121	109	118
United Arab Emirates	1980	..	..	..	..	..	..	33	26	30	..	..	127
Yemen	1975	165	146	156	113	124	118	259	252	256	113	91	103
	1987	106	90	98	41	48	44	142	133	138	118	85	107
East and South-eastern Asia													
Eastern Asia													
China	1985	36	34	35	7.7	8.9	8	43	43	43	106	87	100
Hong Kong, China	1975	15	12	14	3.2	2.9	3	19	15	17	125	110	127
	1985	8.5	7.5	8	1.1	1.0	1	10	8	9	113	110	125
Republic of Korea	1973	38	32	35	9	9	9	47	41	44	119	100	115
	1983	14	12	13	2	2	2	16	14	15	117	100	114
South-eastern Asia													
Indonesia	1970	120	91	106	87	68	77	196	153	175	132	128	128
	1987	78	64	71	44	43	43	118	104	111	122	102	113
Malaysia	1975	36	28	32	13	12	12	48	40	44	129	108	120
	1985	19	15	17	6.3	5.9	6	25	21	23	127	107	119
Myanmar	1982	99	77	88	46	35	41	140	109	125	129	131	128
Philippines	1973	63	54	59	19	22	20	81	75	78	117	86	108
	1988	56	42	49	15	16	16	70	57	64	133	94	123
Singapore	1975	17	12	15	1.9	2.2	2	19	15	17	142	86	127
	1985	10	8	9	1.0	1.0	1	11	9	10	125	100	122
Thailand	1972	110	90	100	68	72	70	170	155	163	122	94	110
	1985	40	33	37	8.9	7.7	8	49	41	45	121	116	120
Viet Nam	1985	40	34	37	15	16	16	55	49	52	118	94	112

TABLE A.8 (*continued*)

Country or area	Reference date	Infant mortality (per 1,000)			Child mortality (per 1,000)			Under-five mortality (per 1,000)			Sex ratio (per 100)		
		Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Infant mortality	Child mortality	Under-five mortality
South-central Asia													
Afghanistan	1978	215	203	209	128	130	129	315	306	311	106	98	103
Bangladesh	1970	158	132	145	101	119	110	243	235	239	120	85	103
	1985	126	106	116	61	80	70	179	177	178	119	76	101
Bhutan	1983	111	103	107	79	80	80	181	175	178	108	99	103
India	1977	116	124	120	72	81	76	179	195	187	94	89	92
	1985	99	97	98	41	57	49	137	148	142	102	72	93
Nepal	1970	157	151	154	87	95	91	231	231	231	104	92	100
	1985	110	104	107	46	59	53	151	158	154	106	78	96
Pakistan	1975	114	101	108	54	67	61	162	162	162	113	81	100
	1985	106	91	99	47	52	50	149	139	144	116	90	107
Sri Lanka	1975	51	41	46	21	23	22	71	63	67	124	91	113
	1985	29	21	25	7.0	7.3	7	36	28	32	138	96	129

Source: United Nations database on mortality in childhood by sex: Asia (POP/1B/DB/96/2), maintained by the Population Division of the United Nations Secretariat (1996).

TABLE A.9. ESTIMATES OF INFANT, CHILD AND UNDER-FIVE MORTALITY, BY SEX; AND SEX RATIOS OF INFANT, CHILD AND UNDER-FIVE MORTALITY, BY COUNTRY AND REFERENCE DATE, LATIN AMERICA AND THE CARIBBEAN

		Infant mortality (per 1,000)			*Child mortality (per 1,000)*			*Under-five mortality (per 1,000)*			*Sex ratio (per 100)*		
Country or area	*Reference date*	*Male*	*Female*	*Both sexes*	*Male*	*Female*	*Both sexes*	*Male*	*Female*	*Both sexes*	*Infant mortality*	*Child mortality*	*Under-five mortality*
Latin America and the Caribbean													
Caribbean													
Cuba	1975	31	25	28	6.4	5.9	6	37	30	34	124	108	123
	1985	17	13	15	2.2	1.9	2	19	15	17	131	116	127
Dominican Republic	1970	100	84	92	46	38	42	141	119	130	119	121	118
	1983	77	55	66	17	22	19	93	75	84	140	77	124
Haiti	1970	158	141	150	80	96	88	226	224	225	112	83	101
	1987	121	95	108	53	57	55	167	147	157	127	93	114
Jamaica	1970	53	43	48	16	15	16	69	57	63	123	107	121
Puerto Rico	1972	30	22	26	5.7	4.6	5	35	26	31	136	124	135
	1985	17	13	15	2.2	1.8	2	19	15	17	131	122	127
Trinidad and Tobago	1972	51	41	46	8.6	8.2	8	59	49	54	124	105	120
	1985	31	23	27	4.2	4.0	4	35	27	31	135	105	130
Central America													
Costa Rica	1972	56	44	50	15	16	16	71	59	65	127	94	120
	1985	20	16	18	3.3	2.8	3	23	18	21	125	118	128
El Salvador	1980	97	82	90	41	44	43	135	123	129	118	93	110
Guatemala	1975	113	97	105	49	56	53	156	148	152	116	88	105
	1985	86	70	78	31	36	34	114	104	109	123	86	110
Honduras	1978	92	70	81	34	36	35	123	103	113	131	94	119
Mexico	1975	76	62	69	27	29	28	101	89	95	123	93	113
	1983	58	50	54	19	19	19	75	68	72	116	100	110
Nicaragua	1980	103	83	93	48	40	44	146	120	133	124	120	122
Panama	1975	44	34	39	16	15	16	59	48	54	129	107	123
	1985	22	18	20	4.0	4.1	4	26	22	24	122	98	118
South America													
Argentina	1970	63	53	58	13	13	13	75	65	70	119	100	115
	1985	31	25	28	3.1	3.1	3	34	28	31	124	100	121
Bolivia	1970	..	..	..	..	..	..	260	225	243	..	..	116
	1987	103	86	95	46	43	44	144	125	135	120	107	115
Brazil	1977	86	65	76	30	24	27	113	88	101	132	125	128
	1985	71	54	63	19	16	17	89	69	79	131	119	129
Chile	1972	73	62	68	17	15	16	90	76	83	118	113	118
	1985	21	17	19	2.2	1.8	2	23	19	21	124	122	121
Colombia	1972	72	58	65	38	29	39	107	95	101	124	131	113
	1983	35	33	34	15	12	13	49	44	47	106	125	111
Ecuador	1975	82	70	76	46	50	48	123	116	120	117	92	106
	1985	48	40	44	21	20	21	69	59	64	120	105	117
Paraguay	1975	54	52	53	21	15	18	73	66	70	104	140	111
	1985	42	36	39	8.2	10.6	9	50	46	48	117	77	109

TABLE A.9 (*continued*)

Country or area	Reference date	Infant mortality (per 1,000)			Child mortality (per 1,000)			Under-five mortality (per 1,000)			Sex ratio (per 100)		
		Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Infant mortality	Child mortality	Under-five mortality
Peru	1973	118	104	111	67	63	65	177	160	169	113	106	111
	1985	77	66	72	30	32	31	105	97	101	117	94	108
Uruguay	1975	52	42	47	7.7	6.9	7	59	49	54	124	116	120
	1985	31	25	28	4.3	3.9	4	35	28	32	124	110	125
Venezuela	1975	51	41	46	13.6	13.7	14	64	54	59	124	99	119
	1985	29	23	26	4.1	4.1	4	33	27	30	126	100	122

Source: United Nations database on mortality in childhood by sex: Latin America and the Caribbean (POP/1B/DB/96/1), maintained by the Population Division of the United Nations Secretariat (1996).

TABLE A.10. PERCENTAGE OF CHILDREN AGED 0-35 MONTHS WHO ARE STUNTED, WASTED OR UNDERWEIGHT FOR SELECTED DEVELOPING COUNTRIES, 1987-1996

Country or area	*Survey period*	*Percentage of children aged 0-35 months*		
		Stunted[a]	*Wasted*[a]	*Underweight*[a]
Sub-Saharan Africa				
Benin	1996	25.0	14.3	29.2
Burkina Faso	1992-1993	28.6	17.2	34.8
Burundi	1987	47.4[b]	5.7[b]	37.5[b]
Cameroon	1991	22.9	3.8	16.3
Central African Republic	1994-1995	33.6	7.1	27.3
Comoros	1996	33.8	8.3	25.8
Côte d'Ivoire	1996	24.4	8.3	23.8
Eritrea	1995-1996	38.4	16.4	43.7
Ghana	1993	25.9	11.3	27.3
Kenya	1993	31.2	6.6	23.3
Madagascar	1992	49.2	5.7	38.9
Malawi	1992	41.5	6.6	27.8
Mali	1995-1996	30.1	23.3	40.0
Namibia	1992	29.0	8.9	26.0
Niger	1992	35.5	18.4	43.9
Nigeria	1990	36.2	10.5	34.6
Rwanda	1992	42.3	5.6	28.9
Senegal	1992-1993	21.7	10.0	21.6
United Republic of Tanzania	1991-1992	39.1	6.7	28.8
Togo	1988	29.2	5.3	24.5
Uganda	1994-1995	35.4	5.9	26.7
Zambia	1992	36.6	6.1	26.3
Zimbabwe	1994	21.4	5.5	15.5
Asia and Northern Africa				
Egypt	1992	27.6	4.1	12.4
India	1992-1993	47.1[c]	19.2[c]	51.5[c]
Jordan	1990	15.8	3.4	6.1
Kazakhstan	1995	15.8	3.3	8.3
Morocco	1992	22.9	2.6	10.2
Nepal	1996	48.4	11.2	46.9
Pakistan	1990-1991	43.0	10.0	36.9
Sri Lanka	1987	27.2[b]	11.6[b]	37.3[b]
Thailand	1987	21.5[b]	5.3[b]	25.3[b]
Tunisia	1988	17.9[b]	3.0[b]	10.3[b]
Turkey	1993	15.7	3.4	9.8
Latin America and the Caribbean				
Bolivia	1994	26.8	4.2	14.9
Brazil	1996	10.3	2.9	5.5
Colombia	1995	12.5	1.4	8.4
Dominican Republic	1991	16.6	1.3	11.0
Guatemala	1995	45.4	4.0	27.1

TABLE A.10 (*continued*)

Country or area	Survey period	Percentage of children aged 0-35 months		
		Stunted[a]	Wasted[a]	Underweight[a]
Haiti	1994-1995	27.0	9.5	25.4
Paraguay	1990	14.9	0.2	4.3
Peru	1991-1992	26.5	2.0	11.2
Trinidad and Tobago	1987	4.8[b]	3.8[b]	6.5[b]

Source: Special tabulations of Demographic and Health Surveys provided by Macro Systems International, Inc.

[a] Children are classified as stunted, wasted or underweight if their height-for-age, weight-for-height or weight-for-age Z-score is below -2 SD from the median of the International Reference Population.

[b] Weight and height are measured only for children three months of age or older.

[c] Percentage underweight is among children in all States of India; percentage wasted is among children in the States included in the last two phases (2 and 3) of the survey (representing about 70 per cent of children). The percentage underweight shown for all States is practically the same as the percentage underweight for those States where only weight was measured and for those States where both weight and height were measured (less than 1 percentage point difference).

TABLE A.11. PERCENTAGE OF CHILDREN AGED 12-23 MONTHS IMMUNIZED WITH SPECIFIC VACCINES FOR SELECTED DEVELOPING COUNTRIES, 1986-1996

Country or area	Survey period	Percentage of children immunized with								Percentage fully immunized	Number of children
		BCG	DPT			Polio			Measles		
			1	2	3	1	2	3			
Sub-Saharan Africa											
Benin	1996	85	82	77	67	82	75	65	64	56	872
Botswana	1988	95	93	92	88	93	92	86	87	81	615
Burkina Faso	1992-1993	85	79	65	41	81	66	41	60	35	1 104
Burundi	1987	77	76	65	55	77	67	57	59	44	663
Cameroon	1991	76	70	59	47	73	63	49	56	40	663
Central African Republic	1994-1995	77	76	62	48	75	60	46	52	37	818
Côte d'Ivoire	1994	74	77	66	51	77	66	51	53	41	1 145
Eritrea	1995	61	61	55	49	61	56	48	51	41	725
Ghana	1993	83	82	73	62	82	74	62	64	55	651
Kenya	1993	96	96	93	87	95	92	86	84	78	1 124
Liberia	1986	60	61	32	20	58	30	18	47	14	817
Madagascar	1992	75	77	66	54	77	66	54	54	43	1 072
Malawi	1992	97	97	94	89	97	94	88	86	82	774
Mali	1995-1996	76	72	51	38	73	55	39	51	32	1 562
Namibia	1992	91	93	82	70	93	82	70	76	58	788
Niger	1992	40	36	24	20	36	24	20	28	17	1 087
Nigeria	1990	61	63	47	33	63	47	33	46	29	1 380
Rwanda	1992	97	96	95	91	96	95	91	90	86	1 010
Senegal	1992-1993	84	77	69	59	78	69	59	57	49	959
Sudan	1989-1990	76	77	69	59	77	69	61	61	52	1 150
Uganda	1995	84	82	74	61	82	73	59	60	47	1 588
United Republic of Tanzania	1991-1992	95	94	90	80	94	89	77	81	71	1 616
Zambia	1992	95	94	88	77	94	88	76	77	67	1 123
Zimbabwe	1994	96	94	92	85	95	92	85	86	80	691
Northern Africa and Asia											
Bangladesh	1993-1994	86	84	78	66	85	78	67	69	59	1 174
Egypt	1995	95	96	93	83	97	94	84	89	79	2 085
Indonesia	1994	78	77	69	59	79	71	60	63	50	3 065
Jordan	1990	17	98	97	95	98	97	95	89	88	1 615
Morocco	1992	93	92	87	79	92	87	79	80	76	985

TABLE A.11 (*continued*)

Country or area	Survey period	Percentage of children immunized with: BCG	DPT 1	DPT 2	DPT 3	Polio 1	Polio 2	Polio 3	Measles	Percentage fully immunized	Number of children
Nepal	1996	76	76	66	54	77	65	51	57	43	1 379
Pakistan	1990-1991	70	67	60	43	68	61	43	50	35	1 215
Philippines	1993	91	91	88	80	91	86	78	81	72	1 742
Sri Lanka	1987	98	98	96	91	98	96	91	67	65	774
Thailand	1987	83	86	79	66	85	78	66	45	37	759
Tunisia	1988	95	96	93	88	96	93	88	84	78	820
Turkey	1993	89	95	88	78	94	88	77	78	64	716
Yemen	1991-1992	59	59	53	45	59	53	45	50	42	6 715
Latin America and the Caribbean											
Bolivia	1993-1994	77	77	60	43	79	63	39	56	31	1 111
Brazil	1996	93	95	90	91	96	92	81	87	73	934
Colombia	1995	82	90	79	64	91	81	65	60	43	761
Dominican Republic	1991	70	96	85	65	97	88	67	70	37	815
Guatemala	1995	78	86	75	59	89	76	56	75	43	1 810
Haiti	1994-1995	73	75	62	41	75	62	41	48	30	667
Mexico	1987	73	77	60	34	94	87	57	59	21	1 017
Paraguay	1990	67	89	76	53	89	76	53	58	34	790
Peru	1991-1992	91	92	82	68	94	86	70	74	58	1 509
Trinidad and Tobago	1987	..	93	88	74	93	88	73	33	..	380

Source: Elizabeth A. Sommerfelt and Andrea L. Piani, *Childhood Immunization: 1990-1994*, Demographic and Health Surveys, Comparative Studies, No. 22 (Calverton, Maryland, Macro International, Inc., 1997), p. 16, table 3.1; and J. Ties Boerma and others; *Immunization: Levels, Trends and Differentials*, Demographic and Health Surveys, Comparative Studies, No. 1 (Columbia, Maryland, Institute for Resource Development/Macro Systems, Inc., December 1990).

TABLE A.12. MATERNAL MORTALITY RATIO, DEVELOPED COUNTRIES, 1970-1995
(Per 100,000 live births)

Region and country	Maternal mortality ratio									
	1970-1974	*1975-1979*	*1980-1984*	*1985-1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*
Asia										
Japan	42.1	24.7	17.8	12.4	8.6	9.0	9.2	7.7	6.1	..
Europe										
Eastern Europe										
Belarus	..	..	22.4[a]	21.9	22.0	..	21.1	20.4	..	..
Bulgaria	34.6	25.5	20.1	17.0	14.3	8.3	15.7	10.7	8.8	..
Czechoslovakia (former)	17.1	12.8	10.2	9.7	7.6	13.0	..	..	..	..
Czech Republic	..	..	..	11.0[b]	8.4	13.1	9.9	11.6	..	..
Hungary	39.5	20.9	19.2	17.4	20.7	12.6	9.9	18.8	10.4	15.2
Poland	21.0	14.6	14.2	12.4	12.8	12.8	9.9	11.8	11.0	9.7
Republic of Moldova	..	..	59.2[a]	38.6	42.8	46.9	50.8	52.9	25.8	..
Romania	126.3	132.0	152.0	152.8	83.6	66.5	60.3	53.2	60.4	47.8
Russian Federation	..	..	63.6[a]	51.5	47.4	52.4	50.8	51.6	52.3	..
Ukraine	..	..	39.4[a]	37.2	..	29.8	31.3	..	..	..
Northern Europe										
Denmark	5.5	6.2	5.6	5.3	1.6	3.1	7.4	7.4	..	..
Estonia	..	..	30.4[a]	36.0	31.4	31.1	22.2	33.0	42.3	..
Finland	9.9	7.7	3.1	6.4	6.1	4.6	4.5	3.1	10.7	1.6
Iceland	23.0	-	-	4.7	21.0	-	-	-	-	..
Ireland	26.7	13.0	7.2	3.5	3.8	7.6	3.9	-	..	..
Latvia	..	..	32.8[a]	37.7	23.7	31.8	31.7	29.9	45.3	..
Lithuania	..	..	31.3[a]	23.8	22.9	19.6	20.5	8.6	11.7	..
Norway	9.5	9.5	3.9	5.5	3.3	8.2	6.7	3.4	-	..
Sweden	7.2	5.1	4.3	5.6	3.2	4.0	-	5.1	0.9	3.9
United Kingdom	15.8	12.0	9.0	6.9	7.6	6.9	6.7	5.6	7.9	..
Southern Europe										
Albania	..	..	..	27.6[c]	..	..	5.3	11.3	..	..
Croatia	..	..	..	3.7	5.4	5.8	-	4.1	6.2	..
Greece	28.2	18.6	13.1	5.5	1.0	2.9	5.9	1.0	1.9	-
Italy	44.8	19.4	10.7	6.1	8.9	4.8	7.2	4.4	..	..
Malta	0.0	17.5	17.9	7.4	-	18.9	-	19.4	-	..
Portugal	57.9	40.0	18.7	9.7	10.3	12.0	9.6	6.1	9.2	8.4
Slovenia	..	..	..	10.4	8.8	4.6	5.0	5.1	-	5.3
Spain	29.6	15.8	9.0	4.7	5.5	3.3	4.8	5.4	3.6	..
Yugoslavia (former)	41.6	20.8	20.2	14.6	10.7	..	..	..	..	..
Western Europe										
Austria	25.0	17.1	10.9	6.9	6.6	7.4	4.2	4.2	8.7	1.1
Belgium	17.1	9.9	7.5	4.2	3.2	4.0	5.6	..	..	..
France	24.4	16.1	14.3	10.1	10.4	11.9	12.9	9.3	11.7	..
Germany	43.1	28.7	16.1	8.5	9.1	8.7	6.7	5.5	5.2	5.4
Luxembourg	48.4	49.8	-	4.6	20.3	-	-	-	18.3	18.4
Netherlands	12.3	9.1	7.4	7.0	7.6	6.0	7.1	8.2	6.1	7.3
Switzerland	20.7	10.8	6.7	6.4	6.0	1.2	4.6	6.0	3.6	..
Northern America										
Canada	15.0	6.6	4.8	4.0	2.5	2.9	4.8	3.9	3.6	4.5
United States of America	17.9	11.1	8.3	7.6	8.2	7.9	7.8	7.5	8.3	..
Oceania										
Australia	15.9	8.4	8.5	5.3	6.5	3.5	3.4	6.1	7.0	..
New Zealand	21.0	14.9	11.8	14.5	6.6	15.0	8.4	20.4	5.2	..

Sources: World Health Organization, *World Health Statistics Annual, 1987* (Geneva, 1987), table 9; *World Health Statistics Annual, 1988* (Geneva, 1988), table 10; *World Health Statistics Annual, 1989* (Geneva, 1990), table 11; *World Health Statistics Annual, 1990* (Geneva, 1991), table 9; *World Health Statistics Annual, 1991* (Geneva, 1992), table 10; *World Health Statistics Annual, 1992* (Geneva, 1993), table D-1; *World Health Statistics Annual, 1993* (Geneva, 1994), tables D-1 and D-6; *World Health Statistics Annual, 1994* (Geneva, 1995) table B; *World Health Statistics Annual, 1995* (Geneva, 1996), table B-1; and World Health Organization, Maternal Health and Safe Motherhood Programme Database.

NOTE: Because of the small number of maternal deaths, the annual rates, particularly in the smaller countries, are subject to large random fluctuations. The high rates for Iceland in 1990, for Luxembourg in 1990 and 1994, and for Malta in 1991 and 1993 were based on only one death.

A dash (-) indicates no maternal deaths.

[a]Data referring to 1981-1982.

[b]Data referring to 1986-1989.

[c]Data referring to 1987-1989.

TABLE A.13. MATERNAL MORTALITY RATIO, SELECTED DEVELOPING COUNTRIES, 1970-1995
(Per 100,000 live births)

Region and country	*Maternal mortality ratio*									
	1970-1974	*1975-1979*	*1980-1984*	*1985-1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*
Africa										
Mauritius	147.8	116.6	87.1	77.4	69.6	70.0	40.8	28.1	71.5	..
Asia										
Armenia	..	..	25.0[a]	31.3	40.1	23.1	12.8	..	..	..
Azerbaijan	..	..	26.5[a]	31.5	9.3	10.5	17.6	34.0	..	..
Georgia	..	..	26.0[a]	26.8	19.4	..	50.0	..	..	..
Hong Kong, China	16.4	10.1	6.0	4.4	4.4	5.9	5.6	4.3	11.2	7.3
Israel	..	12.6	3.1	4.2	12.6	8.5	5.5	2.7	5.2	6.0
Kazakhstan	..	..	48.8[a]	47.9	54.8	48.0	56.9	49.6	48.3	..
Kyrgyzstan	..	..	..	51.2	62.9	55.6	49.9	44.5	42.7	..
Singapore	25.6	17.4	9.6	6.7	2.0	4.1	4.0	8.0	6.1	4.1
Tajikistan	..	..	..	49.3	41.8	53.2	..	..	..	..
Turkmenistan	..	..	..	47.2	42.3	45.9	58.0	42.7	42.7	..
Uzbekistan	..	..	..	49.1	34.1	33.3	30.1	24.5	..	..
Latin America and the Caribbean										
Argentina	..	84.6	64.2	52.0	50.4	48.1	48.3	46.3	..	..
Barbados	118.8	67.4	22.3	75.2[b]	92.7	47.0	71.7	26.4	..	..
Chile	145.1	103.1	53.5	45.2	40.0	35.4	31.0	34.4	25.3	..
Costa Rica	81.6	51.5	27.4	27.9	14.6	34.5	22.5	..	38.6	..
Cuba	60.7	53.0	51.6	44.4	41.8	46.0	45.1	36.8	..	..
Mexico	128.4	121.0	98.0	60.2	54.8	51.3	50.0	44.7	48.2	52.9
Puerto Rico	26.0	13.7	10.2	17.1	19.5	20.2	21.7	..	..	..
Trinidad and Tobago	140.6	94.7	50.2	64.7	54.3	49.2	60.7	66.4	76.2	..
Uruguay	65.5	59.4	44.8	31.3	15.9	..	..	..	..	..
Venezuela	88.5	67.7	56.8	58.3	..	..	53.4	63.1	69.9	..

Sources: World Health Organization, *World Health Statistics Annual, 1987* (Geneva, 1987), table 9; *World Health Statistics Annual, 1988* (Geneva, 1988), table 10; *World Health Statistics Annual, 1989* (Geneva, 1990), table 11; *World Health Statistics Annual, 1990* (Geneva, 1991), table 9; *World Health Statistics Annual, 1991* (Geneva, 1992), table 10; *World Health Statistics Annual, 1992* (Geneva, 1993), table D-1; *World Health Statistics Annual, 1993* (Geneva, 1994), tables D-1 and D-6; *World Health Statistics Annual, 1994* (Geneva, 1995), table B-1; *World Health Statistics Annual, 1995* (Geneva, 1996), table B-1; and WHO Maternal Health and Safe Motherhood Programme Database.

[a]Data referring to 1981-1982.

[b]Data referring to 1986-1989.

TABLE A.14. GOVERNMENTS' PERCEPTIONS OF MORTALITY LEVELS, 1995

Country	Mortality level: Life expectancy at birth[a]	Mortality level: Infant mortality rate (per 1,000 live births)[a]	Mortality level: Acceptable	Population group whose mortality level is of particular concern to Government: Infants	Children especially under age 5	Mothers or pregnant women	Women of reproductive age	Adult men[b]	Other
Africa									
Eastern Africa									
Burundi	46.1	120	No	X	X	-	X	-	-
Comoros	56.0	91	No	X	X	-	X	-	-
Djibouti	50.0	115	No	X	X	-	X	-	-
Eritrea	51.2	107	..	-	-	-	-	-	-
Ethiopia	49.1	119	No	X	X	X	-	-	-
Kenya	55.4	71	No	-	-	-	-	-	-
Madagascar	58.0	93	No	X	X	X	-	-	X
Malawi	42.4	148	No	X	X	X	-	-	-
Mauritius	73.8	18	Yes	X	-	X	-	-	-
Mozambique	47.5	118	No	X	-	-	-	-	-
Rwanda	23.1	139	No	X	X	-	X	-	-
Seychelles	..	..	Yes	-	-	-	-	-	-
Somalia	48.6	122	No	-	-	-	-	-	-
Uganda	42.0	122	No	X	X	X	-	-	X
United Republic of Tanzania	51.9	86	No	X	X	X	-	-	-
Zambia	45.0	111	No	-	-	-	-	-	-
Zimbabwe	51.9	70	No	X	X	-	-	-	-
Middle Africa									
Angola	48.1	124	No	X	X	-	X	-	-
Cameroon	56.2	65	No	X	X	X	-	-	X
Central African Republic	50.9	100	No	X	-	X	-	-	-
Chad	48.3	123	No	-	-	-	-	-	-
Congo	54.1	89	No	X	X	X	-	-	-
Democratic Republic of the Congo	53.7	95	No	X	X	X	-	-	-
Equatorial Guinea	49.6	117	No	X	X	-	X	-	-
Gabon	55.2	94	No	-	-	-	-	-	-
Sao Tome and Principe	..	..	Yes	-	-	-	-	-	-
Northern Africa									
Algeria	68.3	55	No	X	-	-	-	-	-
Egypt	64.8	67	Yes	X	-	-	X	-	-
Libyan Arab Jamahiriya	65.0	68	Yes	-	-	-	-	-	-
Morocco	66.2	62	No	X	X	X	-	-	-
Sudan	52.4	85	No	X	X	X	-	-	-
Tunisia	68.7	43	Yes	X	X	X	-	-	-
Southern Africa									
Botswana	55.8	55	No	-	-	-	X	-	-
Lesotho	59.0	81	No	X	X	-	X	-	-
Namibia	57.2	64	No	X	X	-	X	-	-
South Africa	66.0	53	No	X	X	-	X	-	-
Swaziland	59.8	75	No	-	-	-	-	-	-
Western Africa									
Benin	56.2	90	No	X	X	X	-	-	-
Burkina Faso	47.6	103	No	X	X	-	X	-	-
Cape Verde	65.5	50	No	-	-	-	-	-	-
Côte d'Ivoire	53.6	91	Yes	-	-	-	-	-	-
Gambia	46.6	132	No	X	X	-	X	-	-
Ghana	57.8	81	No	X	X	X	-	-	-
Guinea	45.0	134	No	X	-	X	-	-	-
Guinea-Bissau	44.4	141	No	X	X	-	-	-	-
Liberia	41.0	200	No	X	X	-	X	-	-
Mali	47.6	159	No	X	-	X	-	-	-
Mauritania	53.1	101	No	X	X	X	-	-	-

TABLE A.14 (*continued*)

Country	Mortality level: Life expectancy at birth[a]	Mortality level: Infant mortality rate (per 1,000 live births)[a]	Mortality level: Acceptable	Population group whose mortality level is of particular concern to Government: Infants	Children especially under age 5	Mothers or pregnant women	Women of reproductive age	Adult men[b]	Other
Niger	48.1	124	No	X	X	-	X	-	-
Nigeria	52.0	84	No	-	-	-	-	-	-
Senegal	50.3	68	No	X	X	-	X	-	X
Sierra Leone	35.9	195	No	X	-	-	X	-	-
Togo	52.6	91	No	-	-	-	-	-	-
Asia									
Eastern Asia									
China	70.5	44	Yes	X	X	-	-	-	X
Democratic People's Republic of Korea	73.9	24	Yes	-	-	-	-	-	-
Japan	82.4	4	Yes	-	-	-	-	-	-
Mongolia	65.0	59	No	-	-	-	-	-	-
Republic of Korea	74.8	11	No	-	-	-	-	X	-
South-central Asia									
Afghanistan	44.0	163	No	-	-	-	-	-	-
Bangladesh	55.6	91	No	X	-	-	-	-	-
Bhutan	52.4	117	No	-	-	-	-	-	-
India	60.6	78	No	X	-	X	-	-	-
Iran (Islamic Republic of)	68.0	43	No	X	X	X	-	-	-
Kazakhstan	72.5	34	..	-	-	-	-	-	-
Kyrgyzstan	71.9	39	..	-	-	-	-	-	-
Maldives	60.8	60	No	X	-	-	X	-	-
Nepal	54.1	96	No	X	X	X	-	-	-
Pakistan	62.6	85	Yes	X	-	-	X	-	X
Sri Lanka	74.2	18	No	-	-	-	-	-	X
Tajikistan	70.2	56	Yes	X	X	-	X	-	-
Turkmenistan	68.0	57	..	-	-	-	-	-	-
Uzbekistan	70.7	43	..	-	-	-	-	-	-
South-eastern Asia									
Brunei Darussalam	77.1	9	Yes	-	-	-	-	-	-
Cambodia	52.9	116	No	-	-	-	-	-	-
Indonesia	64.5	58	No	X	-	-	X	-	-
Lao People's Democratic Republic	52.5	97	No	-	-	-	-	-	-
Malaysia	73.0	13	Yes	X	-	-	-	-	-
Myanmar	59.3	90	No	X	-	X	-	-	-
Philippines	68.2	40	No	X	X	X	-	-	X
Singapore	78.5	5	Yes	-	-	-	-	-	-
Thailand	71.7	32	No	-	-	-	-	-	X
Viet Nam	67.3	42	Yes	-	-	-	-	-	-
Western Asia									
Armenia	74.0	25	Yes	X	-	-	-	-	-
Azerbaijan	74.5	33	..	-	-	-	-	-	-
Bahrain	74.1	20	Yes	X	X	X	-	-	-
Cyprus	79.0	9	Yes	-	-	-	-	-	-
Georgia	76.7	23	Yes	X	-	-	-	X	-
Iraq	60.0	127	No	-	-	-	-	-	-
Israel	78.7	9	Yes	-	-	-	-	-	-
Jordan	69.8	36	Yes	-	-	-	-	-	-
Kuwait	77.2	18	Yes	X	-	-	-	-	-
Lebanon	70.5	34	No	-	-	-	-	-	-
Oman	71.8	30	No	-	-	-	-	-	-
Qatar	74.2	20	Yes	-	-	-	-	-	-
Saudi Arabia	71.4	29	No	-	-	-	-	-	-
Syrian Arab Republic	69.2	39	Yes	-	-	-	-	-	-

TABLE A.14 (*continued*)

Country	Mortality level: Life expectancy at birth[a]	Mortality level: Infant mortality rate (per 1,000 live births)[a]	Mortality level: Acceptable	Population group whose mortality level is of particular concern to Government: Infants	Children especially under age 5	Mothers or pregnant women	Women of reproductive age	Adult men[b]	Other
Turkey	69.6	53	No	X	-	-	X	-	-
United Arab Emirates	75.3	19	Yes	-	-	-	-	-	-
Yemen	55.9	92	No	X	X	X	X	-	X
Europe									
Eastern Europe									
Belarus	74.8	16	Yes	X	-	-	-	-	-
Bulgaria	74.9	16	No	-	-	-	-	-	-
Czech Republic	75.2	9	No	-	-	-	-	-	-
Hungary	73.8	14	No	-	-	-	-	X	-
Poland	75.7	14	No	X	-	-	-	X	-
Republic of Moldova	71.5	26	..	-	-	-	-	-	-
Romania	73.2	24	No	X	X	-	-	X	X
Russian Federation	72.7	22	No	X	-	-	-	X	-
Slovakia	75.4	13	..	-	-	-	-	-	-
Ukraine	74.0	18	No	X	X	-	-	X	X
Northern Europe									
Denmark	77.8	8	Yes	-	-	-	-	-	-
Estonia	75.0	15	Yes	-	-	-	-	-	-
Finland	79.6	5	Yes	-	-	-	-	X	X
Iceland	80.7	5	Yes	-	-	-	-	-	-
Ireland	78.6	7	Yes	-	-	-	-	-	-
Latvia	74.3	16	No	X	-	-	-	X	-
Lithuania	76.0	15	Yes	X	-	-	-	X	-
Norway	80.3	5	No	-	-	-	-	-	-
Sweden	80.8	5	Yes	-	-	-	-	-	-
United Kingdom	79.0	7	No	-	X	-	X	X	X
Southern Europe									
Albania	74.0	32	Yes	-	-	-	-	-	-
Andorra	..	..	Yes	-	-	-	-	-	-
Bosnia and Herzegovina	75.1	15	..	-	-	-	-	-	-
Croatia	75.7	11	Yes	-	-	-	-	-	-
Greece	80.1	9	No	-	-	-	-	-	-
Holy See	..	..	Yes	-	-	-	-	-	-
Italy	80.6	8	Yes	-	-	-	-	X	-
Malta	78.3	9	Yes	-	-	-	-	-	-
Portugal	78.1	9	Yes	-	-	-	-	X	X
San Marino	..	..	Yes	-	-	-	-	-	-
Slovenia	77.3	7	..	-	-	-	-	-	-
Spain	81.0	8	Yes	-	-	-	-	-	-
The former Yugoslav Republic of Macedonia	73.6	27	No	X	X	-	-	-	X
Yugoslavia	74.4	21	Yes	X	X	-	-	-	-
Western Europe									
Austria	79.3	7	Yes	-	-	-	-	-	-
Belgium	79.8	8	Yes	-	-	-	-	-	-
France	82.4	7	Yes	-	-	-	-	X	X
Germany	79.1	6	Yes	-	-	-	-	-	-
Liechtenstein	..	..	Yes	-	-	-	-	-	-
Luxembourg	79.0	6	Yes	-	-	-	-	-	-
Monaco	..	..	Yes	-	-	-	-	-	-

TABLE A.14 (*continued*)

Country	Mortality level			Population group whose mortality level is of particular concern to Government					
	Life expectancy at birth[a]	Infant mortality rate (per 1,000 live births)[a]	Acceptable	Infants	Children especially under age 5	Mothers or pregnant women	Women of reproductive age	Adult men[b]	Other
Netherlands	80.2	6	Yes	-	-	-	-	-	X
Switzerland	81.3	5	Yes	-	-	-	-	-	-
Latin America and the Caribbean									
Caribbean									
Antigua and Barbuda	..	..	Yes	-	-	-	-	-	-
Bahamas	76.0	16	Yes	-	-	-	-	-	-
Barbados	77.9	9	Yes	-	-	-	-	-	-
Cuba	77.3	10	Yes	X	X	-	-	-	X
Dominica	..	..	No	-	-	-	-	-	-
Dominican Republic	71.7	42	No	X	X	-	-	-	-
Grenada	..	..	No	-	-	-	-	-	-
Haiti	56.1	89	No	-	-	-	-	-	-
Jamaica	75.8	14	Yes	X	X	-	X	X	-
Saint Kitts and Nevis	..	..	No	-	-	-	-	-	-
Saint Lucia	..	..	No	X	-	-	-	-	-
Saint Vincent and the Grenadines	..	..	Yes	-	-	-	-	-	-
Trinidad and Tobago	75.2	16	Yes	-	X	-	X	X	X
Central America									
Belize	75.0	33	Yes	-	-	-	-	-	-
Costa Rica	78.6	14	Yes	-	-	-	-	-	-
El Salvador	71.8	44	No	X	X	-	-	-	-
Guatemala	67.3	48	No	-	-	-	-	-	-
Honduras	70.1	43	No	X	X	-	-	-	-
Mexico	74.5	34	Yes	X	X	-	X	-	X
Nicaragua	68.7	52	No	X	X	-	-	-	-
Panama	75.0	25	Yes	X	X	-	-	-	X
South America									
Argentina	75.7	24	No	X	X	X	-	-	X
Bolivia	61.0	75	No	X	X	-	X	-	-
Brazil	70.1	47	No	X	-	-	X	-	-
Chile	77.4	14	Yes	-	-	-	-	-	X
Colombia	72.4	28	Yes	-	-	-	-	-	-
Ecuador	71.4	50	No	X	X	X	-	-	-
Guyana	66.4	63	No	-	-	-	-	-	-
Paraguay	70.8	43	Yes	X	-	-	X	-	-
Peru	69.2	55	No	-	-	-	-	-	X
Suriname	72.8	28	Yes	-	-	-	-	-	-
Uruguay	75.7	20	Yes	-	-	-	-	-	-
Venezuela	74.7	23	Yes	X	X	X	-	-	-
Northern America									
Canada	81.4	6	Yes	-	-	-	-	-	X
United States of America	79.3	9	No	X	X	-	-	X	X
Oceania									
Australia-New Zealand									
Australia	80.6	7	No	-	-	-	-	-	X
New Zealand	78.9	9	No	X	-	-	-	-	X
Melanesia									
Fiji	73.7	23	Yes	-	-	-	-	-	-
Papua New Guinea	56.7	68	No	-	-	-	-	-	-
Solomon Islands	72.7	27	No	-	-	-	-	-	-
Vanuatu	67.3	47	No	-	-	-	-	-	-

TABLE A.14 (*continued*)

Country	Mortality level			Population group whose mortality level is of particular concern to Government					
	Life expectancy at birth[a]	*Infant mortality rate (per 1,000 live births)*[a]	*Acceptable*	*Infants*	*Children especially under age 5*	*Mothers or pregnant women*	*Women of reproductive age*	*Adult men*[b]	*Other*
Micronesia									
Kiribati	..	..	No	-	-	-	-	-	-
Marshall Islands	..	..	No	X	X	-	-	-	-
Micronesia (Federated States of)	..	..	No	-	-	-	-	-	-
Nauru	..	..	Yes	-	-	-	-	-	-
Palau	..	..	..	-	-	-	-	-	-
Polynesia									
Cook Islands	..	..	..	-	-	-	-	-	-
Niue	..	..	..	-	-	-	-	-	-
Samoa	69.2	64	No	-	-	-	-	-	-
Tonga	..	..	No	X	-	X	-	-	-
Tuvalu	..	..	No	-	-	-	-	-	-

Sources: Compiled from replies to "The Seventh United Nations Population Inquiry among Governments: Monitoring of Government Perceptions and Policies on Demographic Trends and Levels in Relation to Development as of 1993"; information in the Population Policy Data Bank of the Department of Economic and Social Affairs of the United Nations Secretariat; *World Population Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.XIII.5).

Notes: An X indicates that the population group's mortality level is of particular concern to the Government.
A hyphen (-) indicates that the population group's mortality level is not of particular concern to the Government.
[a]1990-1995.
[b]All adult men or adult men in specific age groups.

Population and Development

TABLE A.15. POPULATION SIZE AND ITS URBAN AND RURAL DISTRIBUTION, 1997, AND COMPONENTS OF GROWTH, 1990-1995, MAJOR AREAS AND REGIONS

(Thousands)

Major area or region	*Population*	*Births*	*Deaths*	*Natural increase*		*Total growth*	*Population*	
		Annual averages					*Urban areas*	*Rural areas*
World total	5 848 739	132 091	51 129	80 961	-	80 961	2 697 884	3 150 855
More developed regions[a]	1 178 418	14 341	11 760	2 580	2 073	4 653	888 260	290 158
Less developed regions[b]	4 670 321	117 750	39 369	78 381	- 2 073	76 309	1 809 624	2 860 697
Least developed countries	610 484	21 973	8 383	13 590	411	14 001	145 259	465 225
Africa	758 394	27 769	9 616	18 153	- 131	18 022	273 550	484 844
Eastern Africa	234 298	9 389	3 606	5 783	- 258	5 524	55 142	179 156
Middle Africa	88 105	3 547	1 176	2 370	236	2 607	29 636	58 469
Northern Africa	164 730	4 557	1 292	3 266	- 103	3 162	81 005	83 725
Southern Africa	49 504	1 431	410	1 021	2	1 024	23 985	25 519
Western Africa	221 756	8 846	3 132	5 713	- 8	5 705	83 782	137 974
Asia	3 538 454	79 640	27 583	52 057	- 1 368	50 689	1 267 690	2 270 763
Eastern Asia	1 447 198	24 271	9 974	14 297	- 108	14 189	555 058	892 140
South-central Asia	1 417 921	38 462	12 750	25 711	- 735	24 976	417 535	1 000 387
South-eastern Asia	497 992	12 192	3 710	8 483	- 502	7 981	173 759	324 232
Western Asia	175 342	4 715	1 149	3 566	- 24	3 543	121 338	54 005
Europe	729 169	8 333	8 174	159	1 027	1 186	540 137	189 031
Eastern Europe	309 169	3 564	3 900	- 335	281	- 54	219 649	89 520
Northern Europe	93 553	1 217	1 052	165	10	175	78 344	15 209
Southern Europe	143 947	1 534	1 368	166	- 106	60	92 784	51 162
Western Europe	182 500	2 018	1 854	163	842	1 005	149 360	33 140
Latin America and the Caribbean	491 931	11 373	3 044	8 330	- 566	7 763	365 065	126 866
Caribbean	36 521	789	270	519	- 90	429	22 868	13 653
Central America	128 304	3 388	646	2 742	- 351	2 391	85 582	42 722
South America	327 106	7 197	2 128	5 068	- 125	4 943	256 615	70 491
Northern America	301 721	4 454	2 499	1 955	970	2 925	231 077	70 644
Oceania	29 071	524	213	310	66	376	20 365	8 706
Australia-New Zealand	21 891	318	157	161	75	236	18 591	3 300
Melanesia	6 077	177	51	126	- 4	122	1 303	4 774
Micronesia	504	15	3	12	- 2	10	218	286
Polynesia	600	14	3	11	- 4	8	254	346

Source: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.XIII.5).

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

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

TABLE A.16. RATE OF POPULATION GROWTH, FERTILITY, MORTALITY AND NET MIGRATION, MAJOR AREAS AND REGIONS, 1990-1995

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	24.1	9.3	0.0	1.48	1.48	2.96	62.2	66.5	64.3
More developed regions[a]	12.4	10.1	1.8	0.22	0.40	1.68	70.4	78.0	74.2
Less developed regions[b]	27.2	9.1	-0.5	1.81	1.77	3.30	60.6	63.7	62.1
Least developed countries	40.4	15.4	0.8	2.50	2.58	5.54	48.7	50.8	49.7
Africa	41.2	14.3	-0.2	2.69	2.68	5.71	50.4	53.3	51.8
Eastern Africa	45.2	17.4	-1.2	2.79	2.67	6.35	45.4	48.0	46.7
Middle Africa	46.2	15.3	3.1	3.09	3.40	6.44	49.3	52.7	51.0
Northern Africa	30.3	8.6	-0.7	2.17	2.11	4.12	60.8	63.4	62.1
Southern Africa	32.0	9.2	0.1	2.28	2.29	4.21	59.3	64.9	62.1
Western Africa	45.3	16.0	-0.0	2.93	2.93	6.43	48.0	51.1	49.5
Asia	24.1	8.3	-0.4	1.57	1.53	2.84	63.2	66.0	64.5
Eastern Asia	17.5	7.2	-0.1	1.03	1.02	1.88	67.6	71.9	69.7
South-central Asia	29.5	9.8	-0.6	1.97	1.92	3.74	59.9	60.8	60.4
South-eastern Asia	26.4	8.0	-1.1	1.84	1.73	3.15	61.7	65.6	63.7
Western Asia	29.7	7.2	-0.1	2.25	2.23	4.06	64.4	68.4	66.3
Europe	11.5	11.3	1.4	0.02	0.16	1.57	68.5	76.9	72.7
Eastern Europe	11.5	12.6	0.9	-0.11	-0.02	1.62	63.0	73.6	68.2
Northern Europe	13.1	11.3	0.1	0.18	0.19	1.81	72.8	78.8	75.8
Southern Europe	10.7	9.6	-0.7	0.12	0.04	1.40	72.7	79.3	76.0
Western Europe	11.3	10.4	4.7	0.09	0.56	1.49	73.2	80.2	76.7
Latin America and the Caribbean	24.9	6.7	-1.2	1.82	1.70	2.93	65.3	71.8	68.5
Caribbean	22.8	7.8	-2.6	1.50	1.24	2.70	66.4	70.8	68.5
Central America	28.8	5.5	-3.0	2.33	2.04	3.41	67.6	73.4	70.5
South America	23.6	7.0	-0.4	1.66	1.62	2.78	64.4	71.4	67.8
Northern America	15.4	8.6	3.4	0.68	1.01	2.02	72.8	79.5	76.2
Oceania	19.1	7.8	2.4	1.13	1.37	2.51	70.3	75.6	72.9
Australia-New Zealand	15.2	7.5	3.6	0.77	1.13	1.93	74.5	80.3	77.4
Melanesia	32.1	9.2	-0.7	2.29	2.22	4.68	58.1	60.3	59.1
Micronesia	33.0	5.8	-4.2	2.72	2.30	4.40	65.7	69.1	67.3
Polynesia	25.4	5.5	-6.5	1.98	1.34	3.53	67.2	71.6	69.3

Source: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.XIII.5).

[a]Comprising all regions of Europe and Northern America, Australia-New Zealand and Japan.
[b]Comprising all regions of Africa, Asia (excluding Japan) and Latin America and the Caribbean, and regions of Melanesia, Micronesia and Polynesia.

TABLE A.17. BIRTHS BY AGE GROUP OF MOTHER; AND DEATHS BY AGE GROUP, MAJOR AREAS AND REGIONS, 1990-1995

Major area or region	Births (thousands)	Births by age group of mother (percentage)			Deaths (thousands)	Deaths by age group (percentage)			
		Under age 20	20-34	35+		0-4	5-14	15-64	65+
World total	660 454	12.6	77.4	10.0	255 646	21.7	5.7	30.7	41.8
More developed regions[a]	71 703	9.0	81.7	9.3	58 802	1.7	0.6	26.4	71.3
Less developed regions[b]	588 750	13.1	76.9	10.1	196 844	27.7	7.2	32.0	33.0
Least developed countries	109 867	17.7	67.9	14.4	41 916	41.0	12.4	31.2	15.5
Africa	138 847	16.3	68.3	15.4	48 081	41.1	12.7	30.5	15.7
Eastern Africa	46 945	16.8	68.7	14.4	18 030	41.8	13.8	32.3	12.1
Middle Africa	17 734	22.8	63.6	13.6	5 882	43.1	13.4	28.9	14.6
Northern Africa	22 786	8.4	74.5	17.1	6 459	31.1	8.5	30.8	29.7
Southern Africa	7 154	12.2	72.2	15.6	2 049	29.8	5.3	35.1	29.8
Western Africa	44 228	17.9	65.8	16.3	15 662	45.2	14.0	28.2	12.6
Asia	398 200	11.3	80.6	8.0	137 913	23.2	5.5	31.6	39.6
Eastern Asia	121 356	1.3	95.5	3.1	49 870	11.4	1.9	31.4	55.4
South-central Asia	192 308	18.1	73.4	8.5	63 751	31.9	8.3	30.3	29.6
South-eastern Asia	60 962	10.1	76.5	13.4	18 549	23.3	5.9	37.2	33.7
Western Asia	23 573	11.2	73.6	15.3	5 743	30.4	5.0	30.3	34.2
Europe	41 665	8.2	82.7	9.0	40 869	1.8	0.6	27.6	70.0
Eastern Europe	17 821	13.2	79.8	7.0	19 498	2.5	0.9	35.2	61.4
Northern Europe	6 084	6.3	83.2	10.5	5 260	1.0	0.3	18.8	79.8
Southern Europe	7 670	5.3	84.4	10.4	6 840	1.7	0.5	21.5	76.3
Western Europe	10 089	2.9	86.3	10.8	9 271	0.9	0.3	20.8	78.0
Latin America and the Caribbean	56 867	16.2	73.0	10.7	15 218	17.5	3.5	37.4	41.6
Caribbean	3 945	14.8	73.8	11.4	1 348	16.4	3.8	32.4	47.4
Central America	16 939	17.3	72.2	10.6	3 230	23.8	4.6	35.2	36.4
South America	35 983	15.9	73.4	10.7	10 641	15.8	3.2	38.7	42.4
Northern America	22 268	12.7	77.5	9.8	12 495	1.8	0.5	24.4	73.3
Oceania	2 619	5.9	78.5	15.5	1 067	8.1	1.9	27.3	62.6
Australia-New Zealand	1 589	5.9	82.8	11.3	785	1.7	0.6	21.2	76.5
Melanesia	883	5.5	71.1	23.5	253	26.2	5.7	45.1	22.9
Micronesia	75	10.0	77.8	12.2	13	28.9	5.9	35.0	30.1
Polynesia	72	9.8	75.2	15.0	16	21.1	3.9	36.1	38.9

Source: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.XIII.5).

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

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

TABLE A.18. INFANT AND CHILD MORTALITY ESTIMATES, MAJOR AREAS AND REGIONS, 1990-1995

Major area or region	Infant mortality rate (per 1,000 births)	Deaths under one year of age (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	62	40 799	82	82	81	55 566	28 594	26 972
More developed regions[a]	11	764	13	15	11	1 012	592	420
Less developed regions[b]	68	40 036	90	90	90	54 552	27 999	26 553
Least developed countries	109	11 989	156	162	150	17 185	9 057	8 128
Africa	94	13 020	145	152	138	19 777	10 537	9 240
Eastern Africa	108	5 056	164	172	156	7 545	4 004	3 540
Middle Africa	97	1 725	149	158	140	2 533	1 365	1 168
Northern Africa	67	1 517	86	91	82	2 008	1 077	931
Southern Africa	55	395	87	94	80	610	334	276
Western Africa	98	4 327	164	172	157	7 080	3 756	3 325
Asia	62	24 717	77	75	80	32 046	15 923	16 124
Eastern Asia	41	4 974	44	40	47	5 684	2 728	2 956
South-central Asia	78	15 045	102	98	107	20 306	9 921	10 386
South-eastern Asia	54	3 275	70	74	65	4 314	2 335	1 978
Western Asia	60	1 423	75	79	71	1 748	941	807
Europe	13	536	16	19	13	736	438	299
Eastern Europe	19	340	23	27	19	484	293	191
Northern Europe	7	45	9	10	8	53	31	23
Southern Europe	11	84	15	16	13	117	67	51
Western Europe	7	67	8	9	7	81	47	34
Latin America and the Caribbean	40	2 265	46	51	41	2 667	1 509	1 158
Caribbean	43	172	55	61	48	221	127	94
Central America	37	621	46	50	42	769	425	344
South America	41	1 472	45	51	40	1 678	958	720
Northern America	9	190	10	11	9	226	127	99
Oceania	26	69	33	34	33	87	45	42
Australia-New Zealand	7	11	9	10	7	14	8	6
Melanesia	59	52	76	75	77	66	34	33
Micronesia	41	3	52	56	49	4	2	2
Polynesia	35	3	43	45	41	3	2	2

Source: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: he 1996 Revision (United Nations publication, Sales No. E.98.X111.5).

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

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

TABLE A.19. AGE COMPOSITION OF THE POPULATION, MAJOR AREAS AND REGIONS, 1997

Major area and region	Population by age group (thousands)			Population by age group (percentage)			Sex ratio by age group (males per 100 females)			Dependency ratios		
	0-14	15-64	65+	0-14	15-64	65+	0-14	15-64	65+	Total	Young age	Elderly
World total	1 803 030	3 657 141	388 569	30.8	62.5	6.6	105.4	102.8	75.7	59.9	49.3	10.6
More developed regions[a]	225 184	790 792	162 442	19.1	67.1	13.8	104.9	99.6	64.3	49.0	28.5	20.5
Less developed regions[b]	1 577 845	2 866 349	226 127	33.8	61.4	4.8	105.5	103.7	85.0	62.9	55.0	7.9
Least developed countries	265 047	326 868	18 570	43.4	53.5	3.0	102.3	99.7	87.1	86.8	81.1	5.7
Africa	329 968	404 335	24 090	43.5	53.3	3.2	101.5	99.0	82.0	87.6	81.6	6.0
Eastern Africa	107 909	119 941	6 448	46.1	51.2	2.8	101.0	98.6	79.9	95.3	90.0	5.4
Middle Africa	40 773	44 579	2 753	46.3	50.6	3.1	100.6	96.5	77.4	97.6	91.5	6.2
Northern Africa	61 740	96 479	6 511	37.5	58.6	4.0	103.9	102.3	86.3	70.7	64.0	6.7
Southern Africa	18 573	28 807	2 124	37.5	58.2	4.3	101.4	98.3	77.5	71.9	64.5	7.4
Western Africa	100 973	114 530	6 253	45.5	51.6	2.8	101.0	97.8	83.3	93.6	88.2	5.5
Asia	1 104 077	2 239 159	195 217	31.2	63.3	5.5	106.9	105.4	84.7	58.0	49.3	8.7
Eastern Asia	360 526	983 960	102 712	24.9	68.0	7.1	109.9	106.1	81.9	47.1	36.6	10.4
South-central Asia	512 886	842 649	62 386	36.2	59.4	4.4	106.3	106.8	92.2	68.3	60.9	7.4
South-eastern Asia	167 400	308 504	22 088	33.6	61.9	4.4	103.8	98.8	79.2	61.4	54.3	7.2
Western Asia	63 266	104 046	8 031	36.1	59.3	4.6	104.2	107.4	80.9	68.5	60.8	7.7
Europe	135 184	490 843	103 142	18.5	67.3	14.1	104.9	98.8	60.6	48.6	27.5	21.0
Eastern Europe	61 655	208 495	39 019	19.9	67.4	12.6	104.0	95.3	51.4	48.3	29.6	18.7
Northern Europe	18 104	61 087	14 362	19.4	65.3	15.4	105.3	100.7	68.9	53.1	29.6	23.5
Southern Europe	23 773	98 237	21 936	16.5	68.2	15.2	106.4	100.0	70.3	46.5	24.2	22.3
Western Europe	31 652	123 023	27 825	17.3	67.4	15.2	105.1	102.9	62.8	48.3	25.7	22.6
Latin America and the Caribbean	160 688	305 619	25 625	32.7	62.1	5.2	103.7	97.6	79.5	61.0	52.6	8.4
Caribbean	10 917	23 141	2 464	29.9	63.4	6.7	103.7	99.3	87.3	57.8	47.2	10.6
Central America	46 243	76 542	5 519	36.0	59.7	4.3	104.0	97.0	83.1	67.6	60.4	7.2
South America	103 528	205 936	17 642	31.6	63.0	5.4	103.5	97.6	77.4	58.8	50.3	8.6
Northern America	65 619	198 399	37 703	21.7	65.8	12.5	104.8	100.8	70.5	52.1	33.1	19.0
Oceania	7 492	18 772	2 807	25.8	64.6	9.7	105.2	103.2	77.9	54.9	39.9	15.0
Australia-New Zealand	4 739	14 581	2 572	21.6	66.6	11.7	105.1	102.1	76.6	50.1	32.5	17.6
Melanesia	2 342	3 541	194	38.5	58.3	3.2	105.3	106.8	92.3	71.6	66.2	5.5
Micronesia	199	288	16	39.5	57.3	3.2	104.9	109.5	93.8	74.6	69.0	5.6
Polynesia	212	363	25	35.3	60.5	4.2	105.9	110.1	91.5	65.3	58.3	7.0

Source: Special tabulation from: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, Sex and Age Annual, 1950-2050 (The 1996 Revision) machine-readable data set (1996).

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

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

TABLE A.20. COUNTRIES OR AREAS WITH THE LARGEST AND THE SMALLEST POPULATION SIZE, 1997

Rank	Country	Population (thousands)
	A. The 10 countries or areas with the largest population	
1.	China	1 243 738
2.	India	960 178
3.	United States of America	271 648
4.	Indonesia	203 480
5.	Brazil	163 132
6.	Russian Federation	147 708
7.	Pakistan	143 831
8.	Japan	125 638
9.	Bangladesh	122 013
10.	Nigeria	118 369
	B. The 10 countries or areas with the smallest population	
1.	Pitcairn	--
2.	Holy See	1
3.	Tokelau	2
4.	Niue	2
5.	Falkland Islands (Malvinas)	2
6.	St. Helena	6
7.	St. Pierre and Miqueleon	7
8.	Anguilla	8
9.	Tuvalu	10
10.	Montserrat	11
	C. The 10 States Members of the United Nations with the smallest population	
1.	Palau	17
2.	San Marino	26
3.	Liechtenstein	32
4.	Monaco	32
5.	Saint Kitts and Nevis	41
6.	Marshall Islands	59
7.	Antigua and Barbuda	67
8.	Dominica	71
9.	Andorra	74
10.	Seychelles	75

Source: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, *World Urbanization Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.X111.6).

TABLE A.21. THE 20 COUNTRIES OR AREAS WITH THE HIGHEST AND THE 20 WITH THE LOWEST PERCENTAGE OF URBAN POPULATION, 1997

Rank	Country	Percentage urban
	A. The 20 countries or areas with the highest percentage of urban population	
1.	Bermuda	100.0
2.	Cayman Islands	100.0
3.	Gibraltar	100.0
4.	Holy See	100.0
5.	Monaco	100.0
6.	Nauru	100.0
7.	Singapore	100.0
8.	Guadeloupe	99.6
9.	Macau	98.8
10.	Kuwait	97.3
11.	Belgium	97.1
12.	Andorra	95.4
13.	Hong Kong, China	95.3
14.	San Marino	94.9
15.	Gaza Strip	94.4
16.	Martinique	94.0
17.	Western Sahara	94.0
18.	Iceland	91.9
19.	Qatar	91.9
20.	St. Pierre and Miquelon	91.7
	B. The 20 countries or areas with the lowest percentage of urban population	
1.	Bangladesh	19.4
2.	Vanuatu	19.3
3.	Niger	19.1
4.	Solomon Islands	18.0
5.	Eritrea	17.7
6.	Montserrat	17.1
7.	Burkina Faso	16.9
8.	Papua New Guinea	16.6
9.	Ethiopia	16.3
10.	Malawi	14.2
11.	Uganda	13.1
12.	Anguilla	11.4
13.	Nepal	10.9
14.	Burundi	8.1
15.	East Timor	7.4
16.	Bhutan	6.5
17.	Rwanda	5.9
18.	Pitcairn	0.0
19.	Tokelau	0.0
20.	Wallis and Futuna Islands	0.0

Source: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, *World Urbanization Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.X111.6).

TABLE A.22. THE 20 LARGEST URBAN AGGLOMERATIONS, 1997

Rank	Agglomeration and country	Population (millions)
1.	Tokyo, Japan	27.5
2.	Mexico City, Mexico	17.3
3.	Sao Paulo, Brazil	17.0
4.	New York, United States of America	16.4
5.	Bombay, India	16.3
6.	Shanghai, China	13.8
7.	Los Angeles, United States of America	12.7
8.	Calcutta, India	12.3
9.	Buenos Aires, Argentina	12.1
10.	Seoul, Republic of Korea	11.9
11.	Beijing, China	11.5
12.	Lagos, Nigeria	11.5
13.	Delhi, India	10.6
14.	Osaka, Japan	10.6
15.	Karachi, Pakistan	10.5
16.	Rio de Janeiro, Brazil	10.3
17.	Cairo, Egypt	10.1
18.	Metro Manila, Philippines	9.9
19.	Tianjin, China	9.7
20.	Paris, France	9.6

Source: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, *World Urbanization Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.X111.6).

TABLE A.23. THE 12 COUNTRIES OR AREAS WITH THE HIGHEST AND THE 10 WITH THE LOWEST FERTILITY, 1990-1995

Rank	Country	Total fertility rate (children per woman)
	A. The 12 countries or areas with the highest fertility	
1.	Gaza Strip	8.80
2.	Yemen	7.60
3.	Niger	7.40
4.	Malawi	7.20
5.	Oman	7.20
6.	Angola	7.20
7.	Uganda	7.10
8.	Mali	7.10
9.	Burkina Faso	7.10
10.	Somalia	7.00
11.	Ethiopia	7.00
12.	Guinea	7.00
	B. The 10 countries or areas with the lowest fertility	
1.	Italy	1.24
2.	Spain	1.27
3.	Germany	1.30
4.	Hong Kong, China	1.32
5.	Slovenia	1.36
6.	Greece	1.38
7.	Austria	1.47
8.	Japan	1.48
9.	Bosnia and Herzegovina	1.50
10.	Romania	1.50

Source: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.X111.5).

TABLE A.24. THE 10 COUNTRIES OR AREAS WITH THE HIGHEST AND THE 10 WITH THE LOWEST LIFE EXPECTANCY, 1990-1995

Rank	Country	Male (years)	Country	Female (years)	Country	Both sexes combined (years)
	A. The 10 countries or areas with the highest life expectancy					
1.	Iceland	76.9	Japan	82.4	Japan	79.5
2.	Japan	76.4	France	82.4	Iceland	78.8
3.	Hong Kong, China	75.6	Canada	81.4	Canada	78.5
4.	Canada	75.6	Hong Kong, China	81.3	Hong Kong, China	78.4
5.	Sweden	75.4	Switzerland	81.3	Sweden	78.1
6.	Israel	75.3	Spain	81.0	France	78.0
7.	Greece	75.0	Sweden	80.8	Switzerland	77.9
8.	Australia	74.7	Iceland	80.7	Australia	77.6
9.	Cyprus	74.7	Australia	80.6	Greece	77.5
10.	Switzerland	74.5	Italy	80.6	Italy	77.5
	B. The 10 countries or areas with the lowest life expectancy					
1.	Rwanda	22.1	Rwanda	23.1	Rwanda	22.6
2.	Sierra Leone	32.9	Sierra Leone	35.9	Sierra Leone	34.4
3.	Liberia	38.0	Liberia	41.0	Liberia	39.4
4.	Uganda	40.0	Uganda	42.0	Uganda	41.0
5.	Guinea-Bissau	41.3	Malawi	42.4	Malawi	42.0
6.	Malawi	41.4	Afghanistan	44.0	Guinea-Bissau	42.8
7.	Burundi	43.0	Guinea-Bissau	44.4	Afghanistan	43.5
8.	Afghanistan	43.0	Zambia	45.0	Zambia	44.2
9.	Zambia	43.3	Guinea	45.0	Guinea	44.5
10.	Gambia	43.4	East Timor	45.9	Burundi	44.6

Source: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.X111.5).

TABLE A.25. THE 10 COUNTRIES OR AREAS WITH THE HIGHEST AND THE 10 WITH THE LOWEST INFANT MORTALITY RATE, 1990-1995

Rank	Country	Infant mortality rate (per 1,000 births)	Rank	Country	Infant mortality rate (per 1,000 births)
	A. The 10 countries or areas with the highest infant mortality			*B. The 10 countries or areas with the lowest infant mortality*	
1.	Liberia	200	1.	Japan	4
2.	Sierra Leone	195	2.	Norway	5
3.	Afghanistan	163	3.	Finland	5
4.	Mali	159	4.	Iceland	5
5.	East Timor	149	5.	Switzerland	5
6.	Malawi	148	6.	Sweden	5
7.	Guinea-Bissau	141	7.	Singapore	5
8.	Rwanda	139	8.	Hong Kong, China	6
9.	Guinea	134	9.	Canada	6
10.	Gambia	132	10.	Germany	6

Source: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.X111.5).

TABLE A.26. TRENDS IN POPULATION SIZE AND GROWTH, MAJOR AREAS, REGIONS AND COUNTRIES, 1975 - 2015, AND GOVERNMENTS' VIEWS AND POLICIES ON POPULATION GROWTH AND IMMIGRATION

Major area, region or country	Mid-year population (thousands)			Average annual growth rate (percentage)			Government's views and policies	
	1975	1997	2015	1990-1995	975-1995	995-2015	View on population growth and type of intervention to modify growth	View and policy on immigration
World total	4 080 992	5 848 739	7 285 881	1.48	1.66	1.24		
More developed regions [a]	1 048 380	1 178 418	1 214 018	0.40	0.55	0.18		
Less developed regions [b]	3 032 612	4 670 321	6 071 863	1.77	1.99	1.48		
Least developed countries	349 699	610 484	944 893	2.58	2.52	2.45		
Africa	413 883	758 394	1 181 288	2.68	2.76	2.48		
Eastern Africa	125 129	234 298	381 598	2.67	2.85	2.72		
Burundi	3 680	6 398	10 037	2.00	2.50	2.52	Too high: intervene to lower	Satisfactory: no intervention
Comoros	316	651	1 081	3.16	3.31	2.84	Too high: intervene to lower	Satisfactory: no intervention
Djibouti	205	634	955	3.00	5.38	2.32	Satisfactory: no intervention	Too high: intervene to lower
Eritrea	2 089	3 409	5 362	1.92	2.09	2.63	Too high: no intervention	Satisfactory: no intervention
Ethiopia	32 221	60 148	103 627	3.17	2.80	3.04	Too high: no intervention	Satisfactory: no intervention
Kenya	13 741	28 414	43 170	2.91	3.40	2.32	Too high: intervene to lower	Satisfactory: no intervention
Madagascar	7 778	15 845	26 984	3.25	3.24	2.98	Too high: intervene to lower	Satisfactory: no intervention
Malawi	5 244	10 086	16 092	0.72	3.06	2.54	Too high: no intervention	Too high: no intervention
Mauritius	892	1 141	1 367	1.10	1.12	1.01	Satisfactory: intervene to maintain	Satisfactory: intervene to lower
Mozambique	10 498	18 265	28 298	3.93	2.49	2.47	Too high: no intervention	Satisfactory: no intervention
Réunion	483	673	827	1.62	1.52	1.17	..	..
Rwanda	4 384	5 883	10 843	-5.88	0.84	3.69	Too high: intervene to lower	Satisfactory: no intervention
Seychelles	59	75	88	1.10	1.07	0.92	Too high: intervene to lower	Satisfactory: intervene to maintain
Somalia	5 471	10 217	18 198	1.92	2.75	3.25	Satisfactory: no intervention	Satisfactory: no intervention
Uganda	11 183	20 791	34 762	3.35	2.83	2.84	Too high: intervene to lower	Satisfactory: no intervention
United Republic of Tanzania	15 900	31 507	49 925	3.28	3.18	2.54	Too high: intervene to lower	Satisfactory: no intervention
Zambia	4 841	8 478	13 201	2.24	2.56	2.45	Too high: intervene to lower	Too high: intervene to lower
Zimbabwe	6 143	11 682	16 781	2.54	3.00	2.03	Too high: intervene to lower	Satisfactory: intervene to lower
Middle Africa	45 332	88 105	145 506	3.40	3.04	2.79		
Angola	6 123	11 569	19 773	3.17	2.85	3.02	Satisfactory: no intervention	Satisfactory: no intervention
Cameroon	7 526	13 937	22 545	2.77	2.81	2.68	Too high: intervene to lower	Satisfactory: intervene to lower
Central African Republic	2 057	3 416	4 977	2.22	2.32	2.10	Too high: no intervention	Satisfactory: no intervention
Chad	4 030	6 702	10 278	2.64	2.26	2.42	Satisfactory: no intervention	Satisfactory: intervene to maintain
Congo	1 447	2 745	4 473	2.99	2.92	2.73	Too high: intervene to lower	Satisfactory: intervene to maintain
Democratic Republic of the Congo	23 251	48 040	80 887	3.90	3.35	2.88	Satisfactory: no intervention	Satisfactory: no intervention
Equatorial Guinea	225	420	645	2.55	2.87	2.39	Satisfactory: intervene to maintain	Satisfactory: no intervention
Gabon	593	1 138	1 740	2.80	2.98	2.40	Too low: intervene to raise	Too high: intervene to lower
Sao Tome and Principe	81	138	189	2.20	2.47	1.76	Satisfactory: no intervention	Satisfactory: no intervention
Northern Africa	96 364	164 730	225 618	2.11	2.47	1.78		
Algeria	16 018	29 473	41 646	2.40	2.81	1.97	Too high: intervene to lower	Satisfactory: no intervention
Egypt	38 841	64 465	85 377	1.96	2.35	1.59	Too high: intervene to lower	Satisfactory: intervene to lower
Libyan Arab Jamahiriya	2 446	5 784	10 050	3.47	3.97	3.10	Satisfactory: no intervention	Too high: intervene to lower
Morocco	17 305	27 518	35 621	1.96	2.14	1.47	Too high: intervene to lower	Satisfactory: no intervention
Sudan	16 012	27 899	40 408	2.09	2.56	2.07	Too high: intervene to lower	Satisfactory: intervene to raise
Tunisia	5 668	9 326	12 121	1.93	2.30	1.50	Satisfactory: intervene to lower	Satisfactory: no intervention
Western Sahara	75	265	394	3.69	6.01	2.32	..	..
Southern Africa	28 997	49 504	71 180	2.29	2.45	2.04		
Botswana	759	1 518	2 195	2.62	3.24	2.07	Too high: intervene to lower	Satisfactory: no intervention
Lesotho	1 187	2 131	3 284	2.56	2.67	2.41	Too high: intervene to lower	Satisfactory: no intervention
Namibia	900	1 613	2 450	2.56	2.67	2.33	Too high: intervene to lower	Satisfactory: intervene to raise
South Africa	25 669	43 336	61 845	2.24	2.40	2.00	Too high: intervene to lower	Satisfactory: intervene to maintain
Swaziland	482	906	1 405	2.81	2.88	2.48	Too high: intervene to lower	Satisfactory: no intervention

TABLE A.26 (*continued*)

Major area, region or country	Mid-year population (thousands) 1975	1997	2015	Average annual growth rate (percentage) 1990-1995	975-1995	995-2015	Government's views and policies: View on population growth and type of intervention to modify growth	View and policy on immigration
Western Africa	118 060	221 756	357 386	2.93	2.87	2.67		
Benin	3 046	5 720	9 593	2.88	2.87	2.86	Satisfactory: no intervention	Satisfactory: no intervention
Burkina Faso	6 108	11 087	18 257	2.86	2.70	2.78	Too high: no intervention	Satisfactory: no intervention
Cape Verde	278	406	590	2.52	1.65	2.11	Too high: intervene to lower	Satisfactory: no intervention
Côte d'Ivoire	6 755	14 300	20 967	3.18	3.53	2.13	Satisfactory: intervene to raise	Too high: intervene to lower
Gambia	548	1 169	1 674	3.76	3.54	2.05	Too high: intervene to lower	Too high: intervene to lower
Ghana	9 835	18 338	29 391	2.87	2.83	2.64	Too high: intervene to lower	Satisfactory: no intervention
Guinea	4 149	7 614	11 942	4.89	2.86	2.43	Too high: intervene to lower	Satisfactory: no intervention
Guinea-Bissau	627	1 112	1 592	2.06	2.66	1.99	Satisfactory: no intervention	Satisfactory: no intervention
Liberia	1 609	2 467	5 094	-3.86	1.39	4.38	Too high: intervene to lower	Satisfactory: intervene to maintain
Mali	6 169	11 480	19 179	3.17	2.80	2.87	Too high: intervene to lower	Satisfactory: intervene to maintain
Mauritania	1 371	2 392	3 663	2.54	2.53	2.38	Satisfactory: no intervention	Satisfactory: no intervention
Niger	4 771	9 788	17 096	3.37	3.26	3.12	Too high: no intervention	Satisfactory: no intervention
Nigeria	62 770	118 369	190 922	3.00	2.88	2.68	Too high: intervene to lower	Satisfactory: intervene to maintain
Senegal	4 806	8 762	13 759	2.52	2.74	2.52	Too high: intervene to lower	Satisfactory: no intervention
Sierra Leone	2 931	4 428	6 735	0.97	1.79	2.37	Too high: no intervention	Satisfactory: no intervention
St. Helena	5	6	7	0.84	0.84	0.84	..	..
Togo	2 285	4 317	6 925	2.96	2.90	2.64	Too high: no intervention	Satisfactory: no intervention
Asia	2 405 612	3 538 454	4 381 181	1.53	1.79	1.21		
Eastern Asia	1 097 010	1 447 198	1 624 362	1.02	1.29	0.67		
China	927 808	1 243 738	1 409 126	1.09	1.37	0.72	Satisfactory: intervene to lower	Satisfactory: intervene to maintain
Democratic People's Republic of Korea	16 301	22 837	27 652	1.63	1.52	1.12	Satisfactory: no intervention	Satisfactory: intervene to maintain
Hong Kong, China	4 396	6 249	6 544	1.42	1.66	0.33	..	..
Japan	111 524	125 638	125 820	0.25	0.57	0.03	Satisfactory: no intervention	Satisfactory: intervene to maintain
Macau	253	451	527	2.87	2.65	1.03	..	..
Mongolia	1 447	2 568	3 585	2.11	2.66	1.88	Satisfactory: intervene to maintain	Satisfactory: intervene to maintain
Republic of Korea	35 281	45 717	51 107	0.93	1.21	0.65	Satisfactory: no intervention	Satisfactory: intervene to lower
South-central Asia	885 813	1 417 921	1 875 469	1.92	2.17	1.58		
Afghanistan	15 378	22 132	36 904	5.74	1.23	3.15	Too high: no intervention	Satisfactory: intervene to maintain
Bangladesh	76 582	122 013	162 682	1.49	2.17	1.60	Too high: intervene to lower	Satisfactory: no intervention
Bhutan	1 159	1 862	2 940	1.46	2.12	2.54	Too low: no intervention	Too high: intervene to lower
India	620 701	960 178	1 211 662	1.76	2.02	1.33	Too high: intervene to lower	Satisfactory: intervene to maintain
Iran (Islamic Republic of)	33 344	71 518	109 532	2.87	3.59	2.36	Too high: intervene to lower	Too high: intervene to lower
Kazakhstan	14 136	16 832	18 717	0.09	0.87	0.54	Satisfactory: intervene to maintain	Satisfactory: intervene to maintain
Kyrgyzstan	3 299	4 481	5 305	0.29	1.51	0.87	Satisfactory: intervene to maintain	Satisfactory: intervene to maintain
Maldives	137	273	474	3.31	3.08	3.11	Too high: intervene to lower	Satisfactory: intervene to lower
Nepal	12 797	22 591	34 125	2.67	2.58	2.32	Too high: intervene to lower	Too high: intervene to lower
Pakistan	74 734	143 831	224 503	2.68	3.00	2.50	Too high: intervene to lower	Satisfactory: no intervention
Sri Lanka	13 603	18 273	22 089	1.00	1.38	1.04	Too high: intervene to lower	Satisfactory: intervene to maintain
Tajikistan	3 442	6 046	8 491	1.89	2.63	1.88	Satisfactory: no intervention	Satisfactory: no intervention
Turkmenistan	2 520	4 235	5 747	2.11	2.40	1.72	Satisfactory: intervene to maintain	Satisfactory: intervene to maintain
Uzbekistan	13 981	23 656	32 299	2.08	2.44	1.75	Satisfactory: intervene to maintain	Satisfactory: intervene to maintain
South-eastern Asia	323 982	497 992	628 731	1.73	1.99	1.33		
Brunei Darussalam	161	307	403	2.64	3.00	1.59	Satisfactory: no intervention	Satisfactory: intervene to lower
Cambodia	7 098	10 516	14 652	2.84	1.73	1.90	Too high: intervene to lower	Satisfactory: intervene to maintain
East Timor	672	843	1 090	1.91	0.96	1.46	..	..
Indonesia	135 666	203 480	251 795	1.54	1.88	1.22	Too high: intervene to lower	Too high: intervene to lower
Lao People's Democratic Republic	3 024	5 194	8 395	3.00	2.39	2.71	Too low: intervene to raise	Satisfactory: intervene to maintain

TABLE A.26 (*continued*)

Major area, region or country	Mid-year population (thousands) 1975	1997	2015	Average annual growth rate (percentage) 1990-1995	1975-1995	1995-2015	Government's views and policies: View on population growth and type of intervention to modify growth	View and policy on immigration
Malaysia	12 258	21 018	27 970	2.37	2.48	1.64	Too high: intervene to lower	Too high: intervene to lower
Myanmar	30 441	46 765	61 128	1.74	1.97	1.52	Satisfactory: no intervention	Satisfactory: intervene to lower
Philippines	43 010	70 724	94 878	2.20	2.28	1.68	Too high: intervene to lower	Satisfactory: intervene to lower
Singapore	2 263	3 439	4 009	1.96	1.93	0.93	Satisfactory: intervene to maintain	Satisfactory: intervene to raise
Thailand	41 359	59 159	66 317	0.94	1.71	0.65	Too high: intervene to lower	Satisfactory: intervene to lower
Viet Nam	48 030	76 548	98 094	2.02	2.15	1.42	Too high: intervene to lower	Satisfactory: no intervention
Western Asia	98 807	175 342	252 619	2.23	2.64	2.05		
Armenia	2 826	3 642	4 021	0.48	1.25	0.51	Satisfactory: intervene to maintain	Satisfactory: no intervention
Azerbaijan	5 689	7 655	8 917	1.01	1.40	0.85	Satisfactory: intervene to maintain	Satisfactory: intervene to maintain
Bahrain	272	582	766	2.56	3.58	1.60	Satisfactory: no intervention	Satisfactory: no intervention
Cyprus	609	766	897	1.81	1.01	0.93	Too low: intervene to raise	Satisfactory: intervene to lower
Gaza Strip	393	863	1 743	4.66	3.50	3.94	..	..
Georgia	4 908	5 434	5 584	-0.04	0.52	0.12	Too low: no intervention	Satisfactory: no intervention
Iraq	11 020	21 177	34 248	2.12	3.00	2.67	Too low: intervene to raise	Satisfactory: intervene to maintain
Israel	3 455	5 781	7 315	3.41	2.35	1.40	Too low: intervene to raise	Too low: intervene to raise
Jordan	2 600	5 774	9 579	4.65	3.63	2.89	Too high: intervene to lower	Satisfactory: intervene to lower
Kuwait	1 007	1 731	2 576	-4.74	2.59	2.10	Satisfactory: intervene to maintain	Satisfactory: intervene to lower
Lebanon	2 767	3 144	3 961	3.27	0.42	1.38	Satisfactory: no intervention	Too high: intervene to lower
Oman	880	2 401	4 752	4.24	4.60	3.83	Too low: intervene to raise	Too high: intervene to lower
Qatar	171	569	734	2.43	5.82	1.46	Too low: intervene to raise	Satisfactory: intervene to maintain
Saudi Arabia	7 251	19 494	33 483	2.58	4.62	3.03	Too low: intervene to raise	Too high: intervene to lower
Syrian Arab Republic	7 438	14 951	22 652	2.73	3.23	2.33	Satisfactory: no intervention	Satisfactory: intervene to maintain
Turkey	40 025	62 774	78 561	1.62	2.09	1.28	Too high: intervene to lower	Satisfactory: intervene to lower
United Arab Emirates	505	2 308	3 049	2.81	7.38	1.61	Too high: no intervention	Too high: intervene to lower
Yemen	6 991	16 294	29 781	5.19	3.83	3.42	Too high: intervene to lower	Too high: intervene to lower
Europe	676 390	729 169	716 745	0.16	0.37	-0.08		
Eastern Europe	285 708	309 169	294 743	-0.02	0.42	-0.26		
Belarus	9 367	10 339	9 948	0.18	0.50	-0.20	Too low: intervene to raise	Satisfactory: intervene to maintain
Bulgaria	8 722	8 427	7 788	-0.49	-0.12	-0.44	Too low: no intervention	Too high: intervene to maintain
Czech Republic	9 997	10 237	9 948	-0.08	0.13	-0.16	Satisfactory: no intervention	Satisfactory: intervene to maintain
Hungary	10 532	9 990	9 094	-0.50	-0.21	-0.53	Too low: intervene to raise	Satisfactory: intervene to lower
Poland	34 022	38 635	39 733	0.23	0.63	0.15	Satisfactory: no intervention	Satisfactory: intervene to maintain
Republic of Moldova	3 839	4 448	4 704	0.33	0.72	0.29	Satisfactory: intervene to maintain	Satisfactory: intervene to maintain
Romania	21 245	22 606	21 768	-0.42	0.34	-0.22	Too low: no intervention	Satisfactory: intervene to lower
Russian Federation	134 233	147 708	138 146	0.02	0.50	-0.36	Satisfactory: no intervention	Too high: intervene to lower
Slovakia	4 736	5 355	5 479	0.31	0.60	0.13	Satisfactory: intervene to maintain	Satisfactory: intervene to lower
Ukraine	49 016	51 424	48 135	-0.05	0.27	-0.36	Too low: intervene to raise	Satisfactory: no intervention
Northern Europe	89 034	93 553	94 830	0.19	0.24	0.08		
Channel Islands	127	150	166	0.75	0.74	0.59	..	..
Denmark	5 060	5 248	5 313	0.32	0.16	0.08	Satisfactory: no intervention	Too high: intervene to lower
Estonia	1 432	1 455	1 320	-1.09	0.19	-0.60	Satisfactory: no intervention	Too high: intervene to lower
Faeroe Islands	41	48	49	0.25	0.73	0.20	..	..
Finland	4 711	5 142	5 267	0.48	0.40	0.15	Satisfactory: no intervention	Satisfactory: intervene to lower
Iceland	218	274	316	1.05	1.04	0.82	Satisfactory: no intervention	Satisfactory: intervene to maintain
Ireland	3 177	3 559	3 715	0.24	0.55	0.23	Satisfactory: no intervention	Satisfactory: intervene to maintain
Isle of Man	60	76	93	1.45	1.07	1.15	..	..
Latvia	2 474	2 474	2 204	-1.13	0.13	-0.70	Too low: no intervention	Too high: intervene to lower
Lithuania	3 308	3 719	3 596	-0.01	0.61	-0.19	Satisfactory: intervene to raise	Satisfactory: intervene to lower

TABLE A.26 (*continued*)

Major area, region or country	Mid-year population (thousands) 1975	1997	2015	Average annual growth rate (percentage) 1990-1995	975-1995	995-2015	Government's views and policies: View on population growth and type of intervention to modify growth	View and policy on immigration
Norway	4 007	4 364	4 568	0.42	0.39	0.27	Satisfactory: no intervention	Satisfactory: no intervention
Sweden	8 193	8 844	9 231	0.53	0.35	0.25	Satisfactory: no intervention	Satisfactory: intervene to maintain
United Kingdom	56 226	58 200	58 992	0.18	0.16	0.08	Satisfactory: no intervention	Too high: intervene to lower
Southern Europe	132 491	143 947	141 763	0.04	0.39	-0.06		
Albania	2 424	3 422	3 947	0.56	1.67	0.77	Satisfactory: intervene to maintain	Satisfactory: intervene to maintain
Andorra	25	74	124	5.50	4.97	3.02	Satisfactory: no intervention	Satisfactory: intervene to maintain
Bosnia and Herzegovina	3 747	3 784	4 375	-3.76	-0.24	1.02	Satisfactory: intervene to maintain	Satisfactory: no intervention
Croatia	4 263	4 498	4 359	-0.06	0.28	-0.16	Satisfactory: intervene to raise	Satisfactory: no intervention
Gibraltar	28	28	28	0.00	0.09	0.00	..	..
Greece	9 047	10 522	10 420	0.45	0.72	-0.02	Too low: intervene to raise	Too high: intervene to lower
Holy See	1	1	1	0.00	0.00	0.00	Satisfactory: no intervention	Satisfactory: intervene to maintain
Italy	55 441	57 241	54 632	0.06	0.16	-0.23	Satisfactory: no intervention	Satisfactory: intervene to maintain
Malta	304	371	410	0.69	0.93	0.56	Satisfactory: no intervention	Satisfactory: no intervention
Portugal	9 093	9 802	9 633	-0.11	0.38	-0.09	Too low: no intervention	Satisfactory: intervene to lower
San Marino	19	26	32	1.50	1.37	1.19	Satisfactory: intervene to maintain	Too high: intervene to lower
Slovenia	1 742	1 922	1 831	0.07	0.50	-0.25	Satisfactory: intervene to maintain	Satisfactory: no intervention
Spain	35 596	39 717	38 946	0.18	0.54	-0.09	Satisfactory: no intervention	Satisfactory: intervene to lower
The former Yugoslav Republic of Macedonia	1 676	2 190	2 443	1.05	1.26	0.62	Too high: intervene to lower	Too high: intervene to lower
Yugoslavia	9 085	10 350	10 582	0.19	0.60	0.16	Satisfactory: intervene to maintain	Satisfactory: no intervention
Western Europe	169 156	182 500	185 409	0.56	0.34	0.12		
Austria	7 579	8 161	8 445	0.86	0.30	0.24	Satisfactory: intervene to maintain	Too high: intervene to lower
Belgium	9 796	10 188	10 322	0.35	0.17	0.10	Satisfactory: no intervention	Too high: intervene to lower
France	52 699	58 542	60 162	0.48	0.49	0.17	Satisfactory: intervene to raise	Too high: intervene to lower
Germany	78 679	82 190	82 115	0.55	0.18	0.03	Satisfactory: no intervention	Too high: intervene to lower
Liechtenstein	23	32	39	1.41	1.45	1.18	Satisfactory: no intervention	Satisfactory: intervene to lower
Luxembourg	362	417	460	1.35	0.59	0.60	Satisfactory: intervene to maintain	Too high: intervene to lower
Monaco	25	32	39	1.20	1.18	1.08	Too low: intervene to raise	Satisfactory: intervene to lower
Netherlands	13 653	15 661	16 185	0.70	0.63	0.22	Satisfactory: no intervention	Too high: intervene to lower
Switzerland	6 339	7 276	7 642	0.95	0.61	0.32	Satisfactory: no intervention	Too high: intervene to lower
Latin America and the Caribbean	320 188	491 931	624 969	1.70	1.99	1.35		
Caribbean	27 171	36 521	44 034	1.24	1.36	1.05		
Anguilla	6	8	10	1.32	1.07	1.17	..	..
Antigua and Barbuda	59	67	76	0.59	0.54	0.74	Satisfactory: intervene to maintain	Satisfactory: no intervention
Aruba	62	71	84	0.91	0.60	0.93	..	..
Bahamas	189	288	361	1.78	1.95	1.29	Satisfactory: no intervention	Too high: intervene to lower
Barbados	246	262	283	0.26	0.30	0.41	Satisfactory: no intervention	Satisfactory: intervene to lower
British Virgin Islands	11	20	28	2.88	2.71	2.08	..	..
Cayman Islands	14	33	50	3.50	3.91	2.44	..	..
Cuba	9 306	11 068	11 646	0.62	0.82	0.30	Satisfactory: no intervention	Satisfactory: intervene to maintain
Dominica	72	71	76	-0.13	-0.10	0.32	Too high: intervene to lower	Satisfactory: intervene to maintain
Dominican Republic	5 048	8 097	10 251	1.91	2.19	1.35	Too high: intervene to lower	Too high: no intervention
Grenada	92	93	103	0.31	0.03	0.57	Satisfactory: intervene to maintain	Satisfactory: no intervention
Guadeloupe	329	437	533	1.64	1.28	1.14	..	..
Haiti	4 920	7 395	10 360	1.92	1.85	1.87	Too high: intervene to lower	Satisfactory: no intervention
Jamaica	2 013	2 515	3 042	0.85	1.02	1.05	Too high: intervene to lower	Satisfactory: no intervention
Martinique	329	388	449	1.07	0.73	0.83	..	..
Montserrat	12	11	11	-0.34	-0.44	0.20	..	..
Netherlands Antilles	166	197	226	0.66	0.77	0.75	..	..

TABLE A.26 (*continued*)

Major area, region or country	Mid-year population (thousands) 1975	1997	2015	Average annual growth rate (percentage) 1990-1995	975-1995	995-2015	Government's views and policies: View on population growth and type of intervention to modify growth	View and policy on immigration
Puerto Rico	2 939	3 771	4 379	0.96	1.15	0.84	..	..
St. Kitts and Nevis	45	41	43	-0.30	-0.46	0.22	Too high: intervene to lower	Satisfactory: intervene to maintain
St. Lucia	108	146	180	1.35	1.37	1.18	Too high: intervene to lower	Satisfactory: intervene to lower
St. Vincent and the Grenadines	93	114	134	0.88	0.93	0.91	Too high: intervene to lower	Satisfactory: no intervention
Trinidad and Tobago	1 012	1 307	1 563	0.80	1.20	0.97	Too high: intervene to lower	Satisfactory: intervene to maintain
Turks and Caicos Islands	6	15	24	3.85	3.87	2.64	..	..
United States Virgin Islands	95	106	122	0.59	0.53	0.74	..	..
Central America	78 482	128 304	169 288	2.04	2.27	1.58		
Belize	134	224	322	2.59	2.33	2.06	Too low: no intervention	Too high: intervene to lower
Costa Rica	1 968	3 575	4 903	2.41	2.77	1.80	Too high: intervene to lower	Too high: intervene to lower
El Salvador	4 102	5 928	8 136	2.37	1.61	1.81	Too high: intervene to lower	Satisfactory: no intervention
Guatemala	6 023	11 241	17 752	2.88	2.84	2.57	Satisfactory: no intervention	Satisfactory: no intervention
Honduras	3 017	5 981	9 044	2.95	3.14	2.35	Satisfactory: no intervention	Satisfactory: intervene to lower
Mexico	59 099	94 281	119 178	1.82	2.17	1.34	Too high: intervene to lower	Satisfactory: intervene to lower
Nicaragua	2 417	4 351	6 502	2.89	2.67	2.28	Too high: intervene to lower	Satisfactory: no intervention
Panama	1 723	2 722	3 451	1.86	2.12	1.36	Satisfactory: no intervention	Satisfactory: intervene to maintain
South America	214 535	327 106	411 647	1.62	1.96	1.30		
Argentina	26 049	35 671	43 498	1.33	1.44	1.12	Satisfactory: no intervention	Satisfactory: intervene to maintain
Bolivia	4 759	7 774	11 218	2.41	2.22	2.07	Satisfactory: no intervention	Satisfactory: no intervention
Brazil	108 167	163 132	199 606	1.44	1.93	1.14	Satisfactory: no intervention	Satisfactory: intervene to maintain
Chile	10 337	14 625	17 912	1.63	1.59	1.16	Satisfactory: no intervention	Satisfactory: no intervention
Colombia	23 776	37 068	47 584	1.88	2.05	1.42	Satisfactory: no intervention	Satisfactory: no intervention
Ecuador	6 907	11 937	15 936	2.20	2.53	1.65	Satisfactory: no intervention	Satisfactory: no intervention
Falkland Islands (Malvinas)	2	2	3	0.58	0.54	0.72	..	..
French Guiana	57	159	268	4.53	4.70	3.02	..	..
Guyana	734	847	1 019	0.85	0.61	1.03	Satisfactory: no intervention	Satisfactory: intervene to raise
Paraguay	2 659	5 088	7 773	2.70	2.98	2.38	Satisfactory: no intervention	Too low: intervene to raise
Peru	15 161	24 367	31 876	1.74	2.20	1.52	Too high: intervene to lower	Satisfactory: no intervention
Suriname	364	437	541	1.28	0.79	1.18	Satisfactory: no intervention	Too high: no intervention
Uruguay	2 829	3 221	3 535	0.58	0.59	0.52	Too low: intervene to raise	Too low: intervene to raise
Venezuela	12 734	22 777	30 877	2.27	2.70	1.73	Satisfactory: no intervention	Satisfactory: no intervention
Northern America	243 483	301 721	345 156	1.01	0.99	0.76		
Bermuda	53	64	71	0.71	0.88	0.58	..	..
Canada	23 209	29 943	34 183	1.13	1.18	0.75	Satisfactory: no intervention	Satisfactory: intervene to raise
Greenland	50	59	65	0.71	0.79	0.58	..	..
St. Pierre and Miquelon	6	7	7	0.71	0.46	0.58	..	..
United States of America	220 165	271 648	310 829	1.00	0.97	0.76	Satisfactory: no intervention	Satisfactory: intervene to maintain
Oceania	21 436	29 071	36 542	1.37	1.39	1.28		
Australia-New Zealand	16 984	21 891	26 297	1.13	1.16	1.02		
Australia	13 900	18 250	21 885	1.13	1.25	1.01	Satisfactory: no intervention	Satisfactory: intervene to maintain
New Zealand	3 083	3 641	4 412	1.16	0.72	1.07	Satisfactory: no intervention	Too low: intervene to raise
Melanesia	3 730	6 077	8 733	2.22	2.22	2.03		
Fiji	576	809	1 052	1.53	1.54	1.47	Satisfactory: intervene to maintain	Satisfactory: intervene to maintain
New Caledonia	133	186	233	1.53	1.53	1.26	..	..
Papua New Guinea	2 729	4 500	6 495	2.27	2.28	2.06	Too high: intervene to lower	Satisfactory: no intervention
Solomon Islands	190	404	678	3.32	3.43	2.92	Too high: intervene to lower	Satisfactory: intervene to maintain
Vanuatu	102	178	275	2.49	2.53	2.43	Satisfactory: no intervention	Satisfactory: no intervention

TABLE A.26 (*continued*)

Major area, region or country	Mid-year population (thousands)			Average annual growth rate (percentage)			Government's views and policies	
	1975	1997	2015	1990-1995	975-1995	995-2015	View on population growth and type of intervention to modify growth	View and policy on immigration
Micronesia	284	504	733	2.30	2.64	2.11		
Guam	95	156	198	2.30	2.27	1.37	..	..
Kiribati	55	81	114	1.61	1.73	1.89	Too high: intervene to lower	Satisfactory: intervene to maintain
Marshall Islands	30	59	106	3.37	3.07	3.29	Too high: intervene to lower	Satisfactory: intervene to lower
Micronesia (Federated States of)	71	130	209	2.54	2.73	2.64	Too high: intervene to lower	Too high: intervene to lower
Nauru	6	11	16	1.89	2.41	2.13	Too low: intervene to raise	Satisfactory: intervene to maintain
Northern Mariana Islands	15	49	67	2.00	5.85	1.66	..	..
Palau	11	17	24	1.63	2.11	1.91	..	..
Polynesia	439	600	779	1.34	1.42	1.45		
American Samoa	30	58	89	3.04	3.05	2.48	..	..
Cook Islands	19	20	23	0.93	0.02	0.85	..	..
French Polynesia	130	227	302	2.07	2.61	1.60	..	..
Niue	4	2	2	-2.15	-3.44	-1.53	..	..
Pitcairn	–	–	–	0.00	-0.29	0.00	..	..
Samoa	151	168	225	0.57	0.43	1.57	Too high: intervene to lower	Too high: intervene to maintain
Tokelau	2	2	2	0.00	0.08	0.00	..	..
Tonga	88	99	107	0.36	0.53	0.41	Too low: no intervention	Satisfactory: intervene to maintain
Tuvalu	6	10	12	1.42	2.10	1.21	Too high: intervene to lower	Satisfactory: intervene to maintain
Wallis and Futuna Islands	9	15	18	1.10	2.31	0.98	..	..

Sources: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.XI11.5); *Global Population Policy Database, 1995* (United Nations publication, Sales No. E.96.XIII.8).

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

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

TABLE A.27. TRENDS IN URBAN AND RURAL POPULATION SIZE AND GROWTH, MAJOR AREAS, REGIONS AND COUNTRIES, 1975-2015

Major area, region or country	Urban population (thousands)			Rural population (thousands)			Percentage urban			Annual growth rate (percentage)					
										Urban population			Rural population		
	1975	1995	2015	1975	1995	2015	1975	1995	2015	1990-1995	1975-1995	1995-2015	1990-1995	1975-1995	1995-2015
World total	1 542 785	2 574 314	3 962 150	2 538 207	3 112 799	3 323 731	37.80	45.27	54.38	2.43	2.56	2.16	0.72	1.02	0.33
More developed[a]	733 287	877 318	971 547	315 093	294 066	242 470	69.94	74.90	80.03	0.73	0.90	0.51	-0.54	-0.35	-0.96
Less developed[b]	809 498	1 696 996	2 990 602	2 223 114	2 818 733	3 081 261	26.69	37.58	49.25	3.37	3.70	2.83	0.86	1.19	0.45
Least developed countries	50 041	131 654	326 447	299 659	447 381	618 447	14.31	22.74	34.55	5.00	4.84	4.54	1.92	2.00	1.62
Africa	104 186	251 412	547 707	309 697	468 083	633 581	25.17	34.94	46.37	4.37	4.40	3.89	1.82	2.07	1.51
Eastern Africa	15 382	49 649	128 584	109 747	171 666	253 014	12.29	22.43	33.70	5.55	5.86	4.76	-1.90	2.24	1.94
Burundi	118	456	1 457	3 562	5 608	8 580	3.22	7.52	14.52	5.62	6.74	5.81	1.73	2.27	2.13
Comoros	67	186	461	249	426	620	21.24	30.45	42.62	4.91	5.11	4.52	2.44	2.69	1.88
Djibouti	140	493	825	65	107	131	68.49	82.14	86.32	3.47	6.28	2.57	0.98	2.54	0.99
Eritrea	256	542	1 404	1 833	2 629	3 958	12.24	17.09	26.18	3.50	3.76	4.76	1.61	1.80	2.05
Ethiopia	3 061	8 695	26 709	29 159	47 709	76 918	9.50	15.41	25.77	5.92	5.22	5.61	2.71	2.46	2.39
Kenya	1 775	7 763	19 229	11 966	19 387	23 942	12.92	28.59	44.54	6.35	7.38	4.54	1.68	2.41	1.06
Madagascar	1 251	3 928	10 608	6 526	10 945	16 376	16.09	26.41	39.31	5.60	5.72	4.97	2.47	2.59	2.01
Malawi	402	1 301	3 650	4 842	8 372	12 441	7.66	13.45	22.68	3.33	5.88	5.16	0.35	2.74	1.98
Mauritius	388	452	664	505	664	703	43.44	40.50	48.56	1.10	0.77	1.92	1.10	1.38	0.28
Mozambique	905	5 841	14 580	9 593	11 418	13 719	8.62	33.84	51.52	8.72	9.32	4.57	1.86	0.87	0.92
Réunion	237	443	639	246	212	188	49.13	67.66	77.23	2.77	3.12	1.83	-0.61	-0.74	-0.59
Rwanda	175	294	966	4 209	4 890	9 877	4.00	5.66	8.91	-4.65	2.58	5.95	-5.95	0.75	3.51
Seychelles	20	40	59	40	33	29	33.26	54.40	67.25	2.87	3.53	1.98	-0.82	-0.83	-0.73
Somalia	1 164	2 433	6 532	4 308	7 058	11 665	21.27	25.63	35.90	3.06	3.69	4.94	1.54	2.47	2.51
Uganda	933	2 469	7 191	10 250	17 220	27 571	8.34	12.54	20.69	5.68	4.87	5.35	3.04	2.59	2.35
United Republic of Tanzania	1 602	7 279	19 115	14 298	22 747	30 810	10.08	24.24	38.29	6.34	7.57	4.83	2.39	2.32	1.52
Zambia	1 686	3 477	6 800	3 155	4 604	6 401	34.84	43.03	51.51	2.74	3.62	3.35	1.88	1.89	1.65
Zimbabwe	1 202	3 556	7 697	4 942	7 634	9 083	19.56	31.78	45.87	4.80	5.43	3.86	1.57	2.17	0.87
Middle Africa	12 052	27 270	64 202	33 280	56 001	81 304	26.59	32.75	44.12	4.60	4.08	4.28	2.85	2.60	1.86
Angola	1 090	3 348	8 723	5 033	7 468	11 051	17.79	30.96	44.11	5.48	5.61	4.79	2.22	1.97	1.96
Cameroon	2 022	5 901	13 270	5 503	7 291	9 275	26.87	44.73	58.86	4.87	5.35	4.05	1.23	1.41	1.20
Central African Republic	693	1 280	2 474	1 364	1 993	2 503	33.67	39.12	49.71	3.08	3.07	3.29	1.69	1.89	1.14
Chad	627	1 409	3 178	3 403	4 927	7 100	15.57	22.23	30.92	3.73	4.04	4.07	2.34	1.85	1.83
Congo	504	1 515	3 135	943	1 078	1 337	34.85	58.41	70.10	4.80	5.50	3.64	0.70	0.67	1.08
Democratic Republic of the Congo	6 860	13 052	31 768	16 391	32 401	49 120	29.50	28.72	39.27	4.44	3.22	4.45	3.68	3.41	2.08
Equatorial Guinea	61	169	396	164	231	249	27.06	42.18	61.41	5.86	5.09	4.27	0.44	1.71	0.37
Gabon	173	539	1 152	420	536	588	29.19	50.14	66.23	5.15	5.69	3.80	0.69	1.23	0.46
Sao Tome and Principe	22	57	106	59	76	83	26.92	42.91	56.18	4.16	4.80	3.11	0.84	1.23	0.44
Northern Africa	37 252	75 895	134 694	59 112	82 182	90 924	38.66	48.01	59.70	3.32	3.56	2.87	1.05	1.65	0.51
Algeria	6 460	15 649	28 112	9 558	12 460	13 534	40.33	55.67	67.50	3.86	4.42	2.93	0.69	1.33	0.41
Egypt	16 877	27 711	45 645	21 964	34 386	39 732	43.45	44.63	53.46	2.27	2.48	2.50	1.71	2.24	0.72
Libyan Arab Jamahiriya	1 489	4 615	9 079	957	792	971	60.86	85.35	90.34	4.31	5.66	3.38	-0.82	-0.95	1.02
Morocco	6 526	13 752	22 895	10 779	12 772	12 726	37.71	51.85	64.27	3.41	3.73	2.55	0.52	0.85	-0.02
Sudan	3 033	8 373	19 671	12 979	18 335	20 737	18.94	31.35	48.68	5.36	5.08	4.27	0.75	1.73	0.62
Tunisia	2 825	5 567	8 906	2 842	3 420	3 216	49.85	61.95	73.47	3.26	3.39	2.35	-0.07	0.92	-0.31
Western Sahara	42	230	386	33	18	8	55.69	92.77	97.89	4.80	8.56	2.59	-6.82	-3.06	-3.85

TABLE A.27 *(continued)*

Major area, region or country	Urban population (thousands)			Rural population (thousands)			Percentage urban			Annual growth rate (percentage)					
										Urban population			Rural population		
	1975	1995	2015	1975	1995	2015	1975	1995	2015	1990-1995	1975-1995	1995-2015	1990-1995	1975-1995	1995-2015
Southern Africa	12 786	22 630	40 017	16 211	24 705	31 163	44.10	47.81	56.22	2.87	2.85	2.85	1.77	2.11	1.16
Botswana	91	870	1 948	668	581	247	11.95	59.96	88.74	9.97	11.30	4.03	-4.95	-0.70	-4.27
Lesotho	128	486	1 278	1 059	1 541	2 006	10.80	23.96	38.91	6.09	6.66	4.84	1.57	1.88	1.32
Namibia	186	553	1 303	715	983	1 147	20.61	35.99	53.18	5.52	5.46	4.29	1.08	1.60	0.77
South Africa	12 314	20 455	34 825	13 355	21 009	27 020	47.97	49.33	56.31	2.45	2.54	2.66	2.05	2.27	1.26
Swaziland	67	266	663	414	590	742	14.01	31.07	47.17	6.10	6.86	4.56	1.49	1.77	1.15
Western Africa	26 714	75 969	180 210	91 347	133 529	177 177	22.63	36.26	50.42	5.08	5.23	4.32	1.80	1.90	1.41
Benin	667	2 076	5 080	2 379	3 334	4 513	21.91	38.37	52.96	5.02	5.67	4.48	1.66	1.69	1.51
Burkina Faso	388	1 664	4 997	5 720	8 815	13 260	6.35	15.88	27.37	6.02	7.29	5.50	2.32	2.16	2.04
Cape Verde	60	209	433	218	177	156	21.42	54.20	73.50	6.62	6.29	3.64	-1.45	-1.05	-0.62
Côte d'Ivoire	2 168	5 948	11 674	4 587	7 746	9 293	32.09	43.44	55.68	4.61	5.05	3.37	2.14	2.62	0.91
Gambia	93	323	712	455	788	963	16.97	29.03	42.50	6.20	6.22	3.96	2.84	2.75	1.00
Ghana	2 956	6 222	14 042	6 879	11 116	15 349	30.06	35.89	47.78	4.03	3.72	4.07	2.25	2.40	1.61
Guinea	676	2 146	5 123	3 473	5 203	6 819	16.30	29.20	42.90	7.47	5.77	4.35	3.91	2.02	1.35
Guinea-Bissau	100	232	505	527	837	1 088	15.95	21.73	31.69	3.69	4.21	3.88	1.64	2.31	1.31
Liberia	488	954	2 893	1 121	1 169	2 200	30.35	44.95	56.80	-2.55	3.35	5.55	-4.87	0.21	3.16
Mali	1 000	2 897	7 682	5 169	7 899	11 496	16.21	26.83	40.06	5.57	5.32	4.88	2.36	2.12	1.88
Mauritania	278	1 165	2 512	1 093	1 109	1 151	20.30	51.23	68.58	5.83	7.16	3.84	-0.41	0.07	0.19
Niger	507	1 666	4 983	4 263	7 486	12 113	10.63	18.20	29.15	5.82	5.94	5.48	2.87	2.81	2.41
Nigeria	14 689	44 184	105 699	48 081	67 537	85 223	23.40	39.55	55.36	5.44	5.51	4.36	1.55	1.70	1.16
Senegal	1 643	3 629	7 776	3 163	4 682	5 983	34.18	43.67	56.52	4.10	3.96	3.81	1.38	1.96	1.23
Sierra Leone	627	1 395	3 145	2 303	2 800	3 590	21.41	33.26	46.70	3.03	4.00	4.06	0.01	0.98	1.24
St. Helena	1	4	6	4	2	1	21.02	62.62	80.38	4.68	6.30	2.09	-4.31	-2.90	-2.39
Togo	373	1 255	2 946	1 912	2 831	3 979	16.32	30.71	42.54	4.48	6.07	4.27	2.32	1.96	1.70
Asia	592 748	1 191 744	2 043 461	1 812 864	2 246 043	2 337 720	24.64	34.67	46.64	3.22	3.49	2.70	0.69	1.07	0.20
Eastern Asia	276 011	524 107	825 861	820 999	897 208	798 501	25.16	36.87	50.84	3.09	3.21	2.27	-0.09	0.44	-0.58
China	160 518	368 723	647 121	767 290	851 501	762 005	17.30	30.22	45.92	3.95	4.16	2.81	-0.03	0.52	-0.56
Democratic People's Republic of Korea	9 243	13 526	19 063	7 058	8 572	8 590	56.70	61.21	68.94	2.07	1.90	1.72	0.97	0.97	0.01
Hong Kong, China	3 943	5 817	6 325	453	305	219	89.70	95.01	96.65	1.60	1.94	0.42	-1.85	-1.97	-1.66
Japan	84 409	97 617	103 167	27 115	27 451	22 653	75.69	78.05	82.00	0.42	0.73	0.28	-0.37	0.06	-0.96
Macau	247	424	522	6	5	5	97.70	98.78	99.03	2.90	2.70	1.04	0.89	-0.52	-0.15
Mongolia	704	1 498	2 526	743	965	1 059	48.66	60.80	70.46	3.07	3.77	2.61	0.71	1.31	0.46
Republic of Korea	16 947	36 501	47 137	18 334	8 407	3 971	48.04	81.28	92.23	2.85	3.84	1.28	-5.76	-3.90	-3.75
South-central Asia	196 643	392 642	728 064	689 170	974 225	1 147 405	22.20	28.73	38.82	3.06	3.46	3.09	1.47	1.73	0.82
Afghanistan	2 040	3 911	11 103	13 338	15 750	25 801	13.27	19.89	30.09	7.47	3.25	5.22	5.34	0.83	2.47
Bangladesh	7 108	21 631	50 073	69 474	96 598	112 610	9.28	18.30	30.78	4.58	5.56	4.20	0.85	1.65	0.77
Bhutan	40	107	340	1 119	1 663	2 600	3.45	6.03	11.56	4.62	4.91	5.79	1.28	1.98	2.23
India	132 272	248 875	435 112	488 429	680 129	776 550	21.31	26.79	35.91	2.72	3.16	2.79	1.42	1.66	0.66
Iran (Islamic Republic of)	15 278	40 328	75 355	18 066	28 037	34 177	45.82	58.99	68.80	3.79	4.85	3.13	1.62	2.20	0.99
Kazakhstan	7 374	10 020	12 796	6 762	6 796	5 921	52.16	59.59	68.37	0.76	1.53	1.22	-0.86	0.03	-0.69
Kyrgyzstan	1 250	1 730	2 540	2 049	2 729	2 765	37.91	38.80	47.88	0.61	1.62	1.92	0.09	1.43	0.07
Maldives	25	68	172	113	186	301	18.05	26.85	36.34	4.01	5.07	4.62	3.05	2.52	2.41

TABLE A.27 *(continued)*

Major area, region or country	Urban population (thousands)			Rural population (thousands)			Percentage urban			Annual growth rate (percentage)					
										Urban population			Rural population		
	1975	1995	2015	1975	1995	2015	1975	1995	2015	1990-1995	1975-1995	1995-2015	1990-1995	1975-1995	1995-2015
Nepal	639	2 212	6 171	12 158	19 245	27 954	4.99	10.31	18.08	5.50	6.21	5.13	2.37	2.30	1.87
Pakistan	19 733	46 732	104 741	55 002	89 525	119 763	26.40	34.30	46.65	4.15	4.31	4.04	1.96	2.44	1.45
Sri Lanka	2 998	3 957	7 078	10 605	13 971	15 010	22.04	22.07	32.05	1.74	1.39	2.91	0.79	1.38	0.36
Tajikistan	1 223	1 876	3 406	2 219	3 951	5 085	35.54	32.20	40.11	1.89	2.14	2.98	1.89	2.89	1.26
Turkmenistan	1 198	1 829	3 011	1 322	2 246	2 736	47.56	44.88	52.40	2.11	2.11	2.49	2.11	2.65	0.99
Uzbekistan	5 465	9 365	16 166	8 516	13 397	16 133	39.09	41.14	50.05	2.36	2.69	2.73	1.88	2.27	0.93
South-eastern Asia	72 213	161 678	292 571	251 768	320 242	336 160	22.29	33.55	46.53	3.79	4.03	2.97	0.76	1.20	0.24
Brunei Darussalam	100	203	317	61	90	86	61.99	69.24	78.66	3.65	3.56	2.23	0.54	1.95	-0.24
Cambodia	731	2 045	4 825	6 367	7 979	9 827	10.30	20.40	32.93	5.93	5.14	4.29	2.12	1.13	1.04
East Timor	60	61	104	612	753	986	8.91	7.49	9.52	1.03	0.09	2.66	1.98	1.04	1.35
Indonesia	26 259	69 947	132 027	109 408	127 513	119 768	19.36	35.42	52.43	4.48	4.90	3.18	0.10	0.77	-0.31
Lao People's Democratic Republic	344	1 010	2 746	2 680	3 872	5 649	11.38	20.69	32.71	5.73	5.38	5.00	2.35	1.84	1.89
Malaysia	4 616	10 796	18 524	7 642	9 344	9 446	37.65	53.60	66.23	3.87	4.25	2.70	0.76	1.01	0.05
Myanmar	7 282	11 660	22 443	23 159	33 447	38 685	23.92	25.85	36.72	2.69	2.35	3.27	1.41	1.84	0.73
Philippines	15 294	36 662	64 286	27 715	31 177	30 592	35.56	54.04	67.76	4.24	4.37	2.81	0.04	0.59	-0.09
Singapore	2 263	3 327	4 009	0	0	0	100.00	100.00	100.00	1.96	1.93	0.93	0.00	0.00	0.00
Thailand	6 244	11 620	19 445	35 115	46 622	46 872	15.10	19.95	29.32	2.20	3.11	2.57	0.63	1.42	0.03
Viet Nam	9 021	14 348	23 844	39 009	59 445	74 250	18.78	19.44	24.31	1.73	2.32	2.54	2.10	2.11	1.11
Western Asia	47 880	113 318	196 966	50 927	54 369	55 653	48.46	67.58	77.97	3.61	4.31	2.76	-0.37	0.33	0.12
Armenia	1 780	2 491	3 014	1 046	1 140	1 007	62.97	68.60	74.96	0.82	1.68	0.95	-0.23	0.43	-0.62
Azerbaijan	2 930	4 191	5 710	2 759	3 340	3 207	51.50	55.65	64.03	1.45	1.79	1.55	0.47	0.95	-0.20
Bahrain	215	503	728	56	54	39	79.23	90.34	94.95	3.18	4.24	1.84	-2.47	-0.24	-1.65
Cyprus	264	403	579	345	342	318	43.38	54.07	64.55	2.82	2.11	1.81	0.68	-0.04	-0.37
Gaza Strip	342	746	1 664	51	46	79	87.00	94.22	95.48	4.82	3.90	4.01	2.25	-0.55	2.71
Georgia	2 432	3 179	3 781	2 476	2 270	1 803	49.54	58.34	67.72	0.77	1.34	0.87	-1.11	-0.43	-1.15
Iraq	6 764	14 975	27 955	4 256	5 120	6 293	61.38	74.52	81.63	2.85	3.97	3.12	0.11	0.92	1.03
Israel	2 994	5 012	6 770	461	513	545	86.64	90.71	92.55	3.50	2.58	1.50	2.47	0.53	0.30
Jordan	1 438	3 834	7 642	1 162	1 539	1 936	55.31	71.36	79.78	5.62	4.90	3.45	2.42	1.41	1.15
Kuwait	844	1 640	2 528	163	51	48	83.81	96.96	98.15	-4.50	3.32	2.17	-11.06	-5.77	-0.38
Lebanon	1 854	2 632	3 668	914	376	293	66.98	87.50	92.61	4.04	1.75	1.66	-1.42	-4.44	-1.25
Oman	173	1 668	4 408	708	539	344	19.61	75.60	92.75	8.17	11.34	4.86	-4.54	-1.37	-2.24
Qatar	142	501	691	29	47	43	82.94	91.37	94.20	2.75	6.30	1.61	-0.75	2.41	-0.53
Saudi Arabia	4 231	15 111	30 031	3 020	3 144	3 453	58.35	82.78	89.69	3.63	6.36	3.43	-1.83	0.20	0.47
Syrian Arab Republic	3 352	7 417	14 066	4 086	6 786	8 585	45.06	52.22	62.10	3.52	3.97	3.20	1.91	2.54	1.18
Turkey	16 651	42 127	66 377	23 375	18 711	12 184	41.60	69.24	84.49	4.10	4.64	2.27	-3.03	-1.11	-2.14
United Arab Emirates	330	1 853	2 708	175	357	341	65.40	83.84	88.81	3.52	8.62	1.90	-0.53	3.58	-0.23
Yemen	1 147	5 034	14 644	5 844	9 992	15 137	16.40	33.50	49.17	8.14	7.40	5.34	3.85	2.68	2.08
Europe	454 582	535 445	566 453	221 808	192 799	150 292	67.21	73.53	79.03	0.56	0.82	0.28	-0.90	-0.70	-1.25
Eastern Europe	171 030	218 090	227 656	114 678	92 416	67 087	59.86	70.24	77.24	0.60	1.22	0.21	-1.41	-1.08	-1.60
Belarus	4 714	7 355	7 997	4 653	2 997	1 952	50.33	71.05	80.38	1.40	2.22	0.42	-2.53	-2.20	-2.14
Bulgaria	5 017	5 809	5 869	3 705	2 700	1 919	57.53	68.27	75.36	0.05	0.73	0.05	-1.58	-1.58	-1.71
Czech Republic	5 780	6 714	7 031	4 217	3 549	2 917	57.82	65.42	70.68	0.06	0.75	0.23	-0.36	-0.86	-0.98

TABLE A.27 *(continued)*

Major area, region or country	Urban population (thousands)			Rural population (thousands)			Percentage urban			Annual growth rate (percentage)					
										Urban population			Rural population		
	1975	1995	2015	1975	1995	2015	1975	1995	2015	1990-1995	1975-1995	1995-2015	1990-1995	1975-1995	1995-2015
Hungary	5 560	6 524	6 657	4 972	3 582	2 437	52.79	64.55	73.20	0.29	0.80	0.10	-1.87	-1.64	-1.93
Poland	18 850	24 543	28 383	15 172	14 014	11 350	55.40	63.65	71.43	0.81	1.32	0.73	-0.75	-0.40	-1.05
Republic of Moldova	1 376	2 289	3 007	2 463	2 148	1 698	35.85	51.59	63.91	1.87	2.55	1.36	-1.19	-0.68	-1.18
Romania	9 809	12 697	14 231	11 436	10 031	7 537	46.17	55.86	65.38	0.40	1.29	0.57	-1.41	-0.66	-1.43
Russian Federation	89 168	112 713	113 221	45 064	35 747	24 925	66.43	75.92	81.96	0.54	1.17	0.02	-1.51	-1.16	-1.80
Slovakia	2 191	3 137	3 725	2 545	2 200	1 754	46.26	58.78	67.99	1.10	1.80	0.86	-0.77	-0.73	-1.13
Ukraine	28 564	36 309	37 535	20 452	15 448	10 599	58.27	70.15	77.98	0.71	1.20	0.17	-1.74	-1.40	-1.88
Northern Europe	72 697	77 988	81 861	16 337	15 384	12 969	81.65	83.52	86.32	0.30	0.35	0.24	-0.38	-0.30	-0.85
Channel Islands	43	44	61	85	104	105	33.51	29.45	36.90	0.75	0.10	1.72	0.75	1.04	0.04
Denmark	4 140	4 451	4 663	920	773	649	81.82	85.21	87.77	0.43	0.36	0.23	-0.27	-0.87	-0.87
Estonia	968	1 086	1 039	464	402	281	67.59	72.99	78.68	-0.76	0.57	-0.22	-1.95	-0.72	-1.78
Faeroe Islands	11	15	22	30	32	27	27.94	32.10	44.64	1.52	1.42	1.85	-0.32	0.43	-0.82
Finland	2 745	3 225	3 732	1 966	1 881	1 535	58.26	63.16	70.85	1.03	0.81	0.73	-0.44	-0.22	-1.02
Iceland	189	246	297	29	23	20	86.64	91.54	93.83	1.26	1.32	0.95	-1.06	-1.24	-0.76
Ireland	1 704	2 039	2 374	1 473	1 507	1 341	53.63	57.50	63.90	0.45	0.90	0.76	-0.03	0.11	-0.58
Isle of Man	31	56	75	28	18	18	52.40	75.20	80.70	1.81	2.87	1.50	0.40	-2.19	-0.10
Latvia	1 618	1 845	1 738	855	691	465	65.42	72.75	78.88	-0.71	0.66	-0.30	-2.22	-1.07	-1.98
Lithuania	1 842	2 689	2 880	1 467	1 047	716	55.67	71.97	80.10	0.90	1.89	0.34	-2.17	-1.68	-1.90
Norway	2 732	3 169	3 564	1 275	1 162	1 004	68.19	73.17	78.02	0.65	0.74	0.59	-0.19	-0.46	-0.73
Sweden	6 778	7 303	7 865	1 415	1 485	1 366	82.73	83.10	85.20	0.53	0.37	0.37	0.53	0.24	-0.42
United Kingdom	49 896	51 821	53 551	6 330	6 258	5 441	88.74	89.23	90.78	0.21	0.19	0.16	-0.09	-0.06	-0.70
Southern Europe	78 369	91 859	98 993	54 122	51 518	42 769	59.15	64.07	69.83	0.36	0.79	0.37	-0.51	-0.25	-0.93
Albania	794	1 259	1 879	1 630	2 124	2 068	32.77	37.21	47.61	1.36	2.30	2.00	0.10	1.33	-0.13
Andorra	24	65	119	1	3	5	96.14	95.39	95.87	5.50	4.93	3.05	5.49	5.85	2.47
Bosnia and Herzegovina	1 172	1 466	2 232	2 575	2 103	2 142	31.29	41.08	51.03	-2.90	1.12	2.10	-4.34	-1.01	0.09
Croatia	1 924	2 513	2 807	2 339	1 992	1 552	45.13	55.78	64.40	0.58	1.33	0.55	-0.83	-0.80	-1.25
Gibraltar	28	28	28	0	0	0	100.00	100.00	100.00	0.00	0.09	0.00	0.00	0.00	0.00
Greece	5 003	6 193	6 782	4 043	4 260	3 637	55.31	59.24	65.09	0.59	1.07	0.45	0.26	0.26	-0.79
Holy See	1	1	1	0	0	0	100.00	100.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Italy	36 394	38 113	38 630	19 047	19 092	16 002	65.64	66.63	70.71	0.03	0.23	0.07	0.12	0.01	-0.88
Malta	245	327	380	60	39	30	80.42	89.28	92.64	1.06	1.45	0.75	-2.15	-2.08	-1.32
Portugal	2 515	3 493	4 492	6 578	6 322	5 142	27.66	35.59	46.63	1.12	1.64	1.26	-0.76	-0.20	-1.03
San Marino	14	24	31	5	1	1	71.70	94.22	97.21	2.06	2.74	1.34	-5.99	-6.57	-2.45
Slovenia	738	988	1 076	1 004	937	755	42.38	51.32	58.79	0.41	1.46	0.43	-0.27	-0.35	-1.08
Spain	24 765	30 297	31 662	10 831	9 330	7 285	69.57	76.45	81.30	0.47	1.01	0.22	-0.74	-0.75	-1.24
The former Yugoslav Republic of Macedonia	847	1 290	1 675	828	866	768	50.57	59.86	68.55	1.75	2.10	1.30	0.04	0.22	-0.60
Yugoslavia	3 905	5 803	7 199	5 181	4 448	3 383	42.98	56.61	68.03	1.43	1.98	1.08	-1.33	-0.76	-1.37
Western Europe	132 486	147 508	157 942	36 670	33 481	27 466	78.32	81.50	85.19	0.77	0.54	0.34	-0.31	-0.45	-0.99
Austria	4 941	5 176	5 786	2 638	2 869	2 659	65.19	64.33	68.51	0.80	0.23	0.56	0.98	0.42	-0.38
Belgium	9 298	9 823	10 114	498	305	207	94.92	96.99	97.99	0.45	0.27	0.15	-2.47	-2.46	-1.92
France	38 481	43 385	47 792	14 218	14 718	12 369	73.02	74.67	79.44	0.66	0.60	0.48	-0.02	0.17	-0.87
Germany	63 866	70 575	73 826	14 814	11 019	8 288	81.17	86.50	89.91	0.83	0.50	0.23	-1.14	-1.48	-1.42

TABLE A.27 *(continued)*

Major area, region or country	Urban population (thousands)			Rural population (thousands)			Percentage urban			Annual growth rate (percentage)					
										Urban population			Rural population		
	1975	1995	2015	1975	1995	2015	1975	1995	2015	1990-1995	1975-1995	1995-2015	1990-1995	1975-1995	1995-2015
Liechtenstein	5	6	12	18	24	27	19.98	21.08	31.11	2.35	1.71	3.13	1.16	1.38	0.50
Luxembourg	267	363	432	95	44	28	73.71	89.08	94.01	1.99	1.53	0.87	-3.19	-3.81	-2.39
Monaco	25	32	39	0	0	0	100.00	100.00	100.00	1.20	1.18	1.08	0.00	0.00	0.00
Netherlands	12 070	13 775	14 720	1 584	1 707	1 465	88.40	88.97	90.95	0.76	0.66	0.33	0.21	0.37	-0.76
Switzerland	3 534	4 373	5 220	2 805	2 794	2 423	55.75	61.02	68.30	1.39	1.06	0.89	0.28	-0.02	-0.71
Latin America and the Caribbean	196 080	349 793	499 324	124 108	126 845	125 645	61.24	73.39	79.90	2.34	2.89	1.78	0.03	0.11	-0.05
Caribbean	13 821	22 026	30 568	13 350	13 660	13 466	50.87	61.72	69.42	2.02	2.33	1.64	0.05	0.11	-0.07
Anguilla	1	1	2	6	7	8	10.00	10.99	18.06	2.59	1.54	3.65	1.17	1.01	0.75
Antigua and Barbuda	20	24	33	39	42	43	34.22	35.83	43.25	0.82	0.78	1.68	0.46	0.42	0.13
Aruba	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bahamas	139	241	330	50	38	31	73.44	86.48	91.46	2.45	2.77	1.57	-2.06	-1.43	-1.01
Barbados	95	123	165	151	137	117	38.60	47.30	58.44	1.36	1.31	1.46	-0.67	-0.47	-0.78
British Virgin Islands	4	10	20	7	8	8	33.55	55.99	71.37	5.07	5.27	3.29	0.41	0.65	-0.07
Cayman Islands	14	31	50	0	0	0	100.00	100.00	100.00	3.50	3.91	2.44	0.00	0.00	0.00
Cuba	5 977	8 314	9 626	3 329	2 650	2 021	64.23	75.83	82.65	1.25	1.65	0.73	-1.23	-1.14	-1.36
Dominica	40	49	57	32	22	18	55.30	69.34	76.02	0.35	1.03	0.78	-1.16	-1.99	-0.91
Dominican Republic	2 289	4 843	7 462	2 760	2 980	2 788	45.34	61.91	72.80	3.10	3.75	2.16	0.11	0.38	-0.33
Grenada	30	33	49	62	59	55	32.58	35.78	47.18	1.18	0.49	1.96	-0.16	-0.22	-0.40
Guadeloupe	272	422	532	56	2	1	82.94	99.43	99.88	1.83	2.18	1.17	-17.59	-15.72	-6.85
Haiti	1 069	2 264	4 638	3 851	4 860	5 722	21.73	31.78	44.77	3.85	3.75	3.59	1.08	1.16	0.82
Jamaica	888	1 326	1 932	1 125	1 142	1 110	44.13	53.71	63.50	1.71	2.00	1.88	-0.10	0.08	-0.14
Martinique	234	355	433	95	26	15	71.20	93.27	96.58	1.67	2.08	1.00	-5.74	-6.53	-2.56
Montserrat	1	2	3	10	9	8	11.76	16.29	26.72	1.80	1.19	2.67	-0.73	-0.70	-0.47
Netherlands Antilles	113	134	170	53	60	55	67.90	69.19	75.60	0.90	0.87	1.20	0.11	0.57	-0.41
Puerto Rico	1 845	2 714	3 500	1 094	987	878	62.77	73.34	79.94	1.52	1.93	1.27	-0.51	-0.52	-0.58
St. Kitts and Nevis	16	14	17	29	27	26	35.03	33.98	39.27	-0.67	-0.62	0.94	-0.11	-0.38	-0.20
St. Lucia	42	53	79	66	89	102	38.64	37.16	43.65	1.33	1.18	1.99	1.37	1.49	0.64
St. Vincent and the Grenadines	19	54	91	74	58	43	20.57	48.11	67.96	4.25	5.18	2.63	-1.82	-1.20	-1.50
Trinidad and Tobago	637	923	1 240	374	364	323	63.00	71.74	79.31	1.56	1.85	1.47	-0.99	-0.14	-0.59
Turks and Caicos Islands	3	6	13	4	8	11	42.81	43.62	52.99	4.32	3.96	3.61	3.49	3.80	1.73
United States Virgin Islands	42	47	66	52	58	56	44.50	45.14	53.88	0.88	0.60	1.62	0.36	0.47	-0.13
Central America	44 870	81 899	120 894	33 612	41 575	48 395	57.17	66.33	71.41	2.32	3.01	1.95	1.48	1.06	0.76
Belize	67	99	164	67	114	158	50.17	46.51	51.03	2.18	1.96	2.52	2.95	2.69	1.62
Costa Rica	814	1 688	2 954	1 154	1 736	1 948	41.34	49.30	60.26	3.39	3.65	2.80	1.51	2.04	0.58
El Salvador	1 658	2 551	4 363	2 444	3 112	3 773	40.41	45.05	53.62	2.89	2.15	2.68	1.94	1.21	0.96
Guatemala	2 211	4 129	8 579	3 812	6 492	9 173	36.71	38.87	48.33	3.33	3.12	3.66	2.60	2.66	1.73
Honduras	969	2 474	5 072	2 048	3 179	3 973	32.11	43.77	56.08	4.41	4.69	3.59	1.88	2.20	1.11
Mexico	37 091	66 931	92 887	22 008	24 214	26 292	62.76	73.43	77.94	2.09	2.95	1.64	1.10	0.48	0.41
Nicaragua	1 216	2 563	4 634	1 201	1 561	1 867	50.30	62.14	71.28	3.81	3.73	2.96	1.48	1.31	0.90
Panama	845	1 464	2 240	878	1 167	1 211	49.04	55.64	64.90	2.55	2.75	2.13	1.02	1.42	0.19
South America	137 389	245 868	347 863	77 146	71 609	63 784	64.04	77.44	84.51	2.38	2.91	1.74	-0.77	-0.37	-0.58
Argentina	21 029	30 623	39 955	5 021	4 145	3 543	80.73	88.08	91.86	1.69	1.88	1.33	-1.13	-0.96	-0.79

TABLE A.27 *(continued)*

Major area, region or country	Urban population (thousands)			Rural population (thousands)			Percentage urban			Annual growth rate (percentage)					
										Urban population			Rural population		
	1975	1995	2015	1975	1995	2015	1975	1995	2015	1990-1995	1975-1995	1995-2015	1990-1995	1975-1995	1995-2015
Bolivia	1 975	4 487	8 273	2 783	2 927	2 945	41.51	60.53	73.75	4.11	4.10	3.06	0.05	0.25	0.03
Brazil	66 148	124 624	172 621	42 019	34 390	26 985	61.15	78.37	86.48	2.39	3.17	1.63	-1.70	-1.00	-1.21
Chile	8 103	11 922	15 573	2 234	2 288	2 338	78.39	83.90	86.95	1.78	1.93	1.34	0.86	0.12	0.11
Colombia	14 434	26 009	38 080	9 342	9 805	9 504	60.71	72.62	80.03	2.62	2.94	1.91	0.04	0.24	-0.16
Ecuador	2 926	6 751	11 256	3 981	4 709	4 680	42.36	58.91	70.63	3.54	4.18	2.56	0.43	0.84	-0.03
Falkland Islands (Malvinas)	1	2	2	1			56.35	84.10	95.22	3.01	2.54	1.34	-8.88	-4.51	-5.30
French Guiana	40	112	221	18	35	48	69.12	76.44	82.29	5.02	5.21	3.39	3.03	3.35	1.59
Guyana	220	294	489	514	536	530	29.97	35.42	48.01	2.13	1.45	2.55	0.18	0.21	-0.06
Paraguay	1 036	2 531	5 050	1 622	2 297	2 723	38.98	52.42	64.96	4.17	4.46	3.45	1.19	1.74	0.85
Peru	9 318	16 676	24 821	5 843	6 855	7 055	61.46	70.87	77.87	2.30	2.91	1.99	0.44	0.80	0.14
Suriname	163	210	329	201	217	212	44.79	49.15	60.80	2.24	1.25	2.25	0.39	0.38	-0.12
Uruguay	2 349	2 876	3 295	479	310	241	83.05	90.27	93.19	0.89	1.01	0.68	-2.03	-2.18	-1.26
Venezuela	9 646	18 750	27 898	3 088	3 095	2 979	75.75	85.83	90.35	2.71	3.32	1.99	-0.19	0.01	-0.19
Northern America	179 801	226 067	279 169	63 682	70 577	65 987	73.85	76.21	80.88	1.23	1.14	1.05	0.32	0.51	-0.34
Bermuda	53	63	71	0	0	0	100.00	100.00	100.00	0.71	0.88	0.58	0.00	0.00	0.00
Canada	17 548	22 546	27 284	5 661	6 856	6 899	75.61	76.68	79.82	1.15	1.25	0.95	1.04	0.96	0.03
Greenland	37	47	56	13	11	9	74.39	80.96	85.82	1.09	1.21	0.87	-0.86	-0.70	-0.90
St. Pierre and Miquelon	5	6	7	1	1		88.56	91.46	93.43	0.84	0.63	0.69	-0.68	-1.00	-0.73
United States of America	162 157	203 406	251 751	58 008	63 710	59 079	73.65	76.15	80.99	1.24	1.13	1.07	0.25	0.47	-0.38
Oceania	15 388	19 853	26 035	6 048	8 452	10 506	71.79	70.14	71.25	1.25	1.27	1.36	1.66	1.67	1.09
Australia-New Zealand	14 495	18 189	22 759	2 488	3 239	3 538	85.35	84.89	86.54	1.10	1.13	1.12	1.32	1.32	0.44
Australia	11 943	15 131	18 813	1 957	2 736	3 072	85.92	84.69	85.97	1.03	1.18	1.09	1.65	1.67	0.58
New Zealand	2 552	3 058	3 945	531	503	467	82.78	85.88	89.42	1.43	0.90	1.27	-0.39	-0.27	-0.37
Melanesia	641	1 217	2 504	3 089	4 597	6 228	17.18	20.93	28.68	3.23	3.21	3.61	1.96	1.99	1.52
Fiji	212	318	531	364	466	521	36.72	40.55	50.51	2.17	2.04	2.57	1.11	1.23	0.55
New Caledonia	70	112	164	63	69	68	52.87	61.99	70.57	2.22	2.32	1.91	0.45	0.45	-0.02
Papua New Guinea	326	690	1 541	2 403	3 611	4 954	11.93	16.05	23.72	3.63	3.76	4.02	2.02	2.04	1.58
Solomon Islands	17	64	194	173	314	484	9.08	17.01	28.57	6.39	6.57	5.51	2.74	2.98	2.17
Vanuatu	16	32	74	86	137	201	15.72	18.90	27.02	3.20	3.45	4.21	2.33	2.34	1.90
Micronesia	104	205	382	180	276	351	36.72	42.65	52.17	2.84	3.39	3.11	1.91	2.15	1.20
Guam	31	58	92	64	93	105	32.45	38.30	46.69	2.37	3.10	2.36	2.26	1.82	0.64
Kiribati	17	28	51	39	50	63	30.14	35.73	44.61	2.24	2.58	3.00	1.27	1.32	1.15
Marshall Islands	18	38	82	12	17	23	60.66	69.01	77.79	4.35	3.71	3.89	1.34	1.88	1.63
Micronesia (Federated States of)	18	34	81	54	89	127	24.63	27.67	38.92	3.60	3.31	4.35	2.14	2.52	1.80
Nauru	6	11	16	0	0	0	100.00	100.00	100.00	1.89	2.41	2.13	0.00	0.00	0.00
Northern Mariana Islands	8	26	41	7	22	26	53.00	53.59	61.41	2.22	5.91	2.34	1.75	5.79	0.74
Palau	7	12	19	4	5	5	61.87	71.15	77.72	2.11	2.81	2.35	0.51	0.72	0.61
Polynesia	148	242	390	291	341	389	33.69	41.54	50.05	2.28	2.47	2.38	0.69	0.79	0.66
American Samoa	13	27	54	17	27	35	43.00	50.30	60.65	3.93	3.83	3.42	2.17	2.36	1.31
Cook Islands	10	12	16	9	8	7	54.04	60.40	70.03	1.83	0.57	1.59	-0.37	-0.73	-0.54
French Polynesia	73	123	189	57	95	112	56.01	56.36	62.82	2.07	2.64	2.15	2.07	2.57	0.80
Niue	1	1	1	3	1	1	23.31	29.40	33.33	-3.11	-2.28	-0.90	-1.74	-3.85	-1.82

TABLE A.27 *(continued)*

Major area, region or country	Urban population (thousands)			Rural population (thousands)			Percentage urban			Annual growth rate (percentage)					
										Urban population			Rural population		
	1975	1995	2015	1975	1995	2015	1975	1995	2015	1990-1995	1975-1995	1995-2015	1990-1995	1975-1995	1995-2015
Pitcairn	0	0	0	--	--	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Samoa	32	35	60	119	130	165	20.96	21.00	26.73	0.57	0.44	2.77	0.57	0.43	1.19
Tokelau	0	0	0	2	2	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00
Tonga	18	40	62	70	58	45	20.30	40.97	57.72	3.46	4.04	2.13	-1.53	-0.97	-1.26
Tuvalu	2	4	8	5	5	4	25.22	46.78	64.09	4.11	5.19	2.78	-0.67	0.40	-0.76
Wallis and Futuna Islands	0	0	0	9	14	18	0.00	0.00	0.00	0.00	0.00	0.00	1.10	2.31	0.98

Source: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, *World Urbanization Prospects: The 1996 Revision* (United Nations publication, Sales No E.98.XIII.6).

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

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

TABLE A.28. POPULATION OF URBAN AGGLOMERATIONS WITH 750,000 OR MORE INHABITANTS IN 1995, 1975-2015

Agglomeration and country	Population (millions) 1975	1995	2015	Population residing in agglomeration, 1995, as percentage of: Total population	Urban population	Annual growth rate, 1990-1995 (percentage)	Percentage increase between 1975 and 1995	1995 and 2015
Aachen, Germany	951	1 040	1 083	1.3	1.5	0.77	9.3	4.1
Abidjan, Côte d'Ivoire	960	2 793	5 259	20.4	47.0	4.88	190.9	88.3
Abu Dhabi, United Arab Emirates	128	799	1 161	36.2	43.1	4.97	525.6	45.3
Accra, Ghana	851	1 673	3 469	9.7	26.9	3.52	96.5	107.3
Adana, Turkey	471	1 087	1 734	1.8	2.6	3.64	130.9	59.6
Addis Ababa, Ethiopia	929	2 431	6 578	4.3	28.0	4.80	161.6	170.7
Adelaide, Australia	882	1 039	1 182	5.8	6.9	0.38	17.9	13.7
Agra, India	681	1 051	1 662	0.1	0.4	2.38	54.4	58.1
Ahmedabad, India	2 050	3 711	5 842	0.4	1.5	2.62	81.0	57.4
Ahvaz, Iran (Islamic Republic of)	309	845	1 614	1.2	2.1	4.11	173.8	90.9
Aleppo, Syrian Arab Republic	879	1 840	3 305	13.0	24.8	3.53	109.4	79.6
Alexandria, Egypt	2 241	3 584	5 441	5.8	12.9	2.34	59.9	51.8
Algiers, Algeria	1 627	3 705	6 352	13.2	23.7	4.00	127.7	71.4
Allahabad, India	568	946	1 525	0.1	0.4	2.62	66.6	61.2
Alma-Ata, Kazakhstan	834	1 245	1 530	7.4	12.4	1.44	49.2	22.9
Amman, Jordan	500	1 183	2 284	22.0	30.8	4.27	136.5	93.1
Amritsar, India	512	765	1 160	0.1	0.3	1.75	49.3	51.7
Amsterdam, Netherlands	989	1 108	1 171	7.2	8.0	1.01	12.0	5.7
Ankara, Turkey	1 709	2 846	4 028	4.7	6.8	2.26	66.6	41.5
Anshan, China	1 082	1 441	2 130	0.1	0.4	1.31	33.2	47.8
Antananarivo, Madagascar	415	876	2 218	5.9	22.3	4.91	111.4	153.1
Arbil, Iraq	247	1 743	3 787	8.7	11.6	8.20	605.2	117.3
Asansol, India	289	1 051	2 406	0.1	0.4	7.35	263.5	129.0
Asunción, Paraguay	551	1 081	1 959	22.4	42.7	3.06	96.1	81.2
Athens, Greece	2 738	3 093	3 118	29.6	49.9	0.15	13.0	0.8
Atlanta, United States of America	1 387	2 462	3 041	0.9	1.2	2.50	77.6	23.5
Auckland, New Zealand	729	945	1 194	26.5	30.9	1.50	29.7	26.4
Aurangabad, India	218	778	1 654	0.1	0.3	6.28	256.4	112.6
Baghdad, Iraq	2 815	4 336	6 866	21.6	29.0	1.42	54.1	58.3
Baku, Azerbaijan	1 429	1 848	2 335	24.5	44.1	1.07	29.3	26.4
Baltimore, United States of America	1 670	1 967	2 264	0.7	1.0	0.76	17.8	15.1
Bamako, Mali	377	919	2 249	8.5	31.7	4.40	143.6	144.7
Bandung, Indonesia	1 493	2 896	5 089	1.5	4.1	3.26	94.0	75.7
Bangalore, India	2 111	4 799	8 005	0.5	1.9	3.46	127.4	66.8
Bangkok, Thailand	3 842	6 547	9 844	11.2	56.3	2.08	70.4	50.4
Baotou, China	918	1 339	2 044	0.1	0.4	1.72	45.9	52.6
Barcelona, Spain	2 873	2 819	2 819	7.1	9.3	-0.65	-1.9	0.0
Barquisimeto, Venezuela	475	828	1 166	3.8	4.4	2.18	74.3	40.9
Barranquilla, Colombia	731	1 138	1 559	3.2	4.4	1.92	55.6	37.0
Beijing, China	8 545	11 299	15 572	0.9	3.1	0.87	32.2	37.8
Beirut, Lebanon	1 062	1 826	2 481	60.7	69.3	2.86	71.9	35.9
Belgrade, Yugoslavia	975	1 204	1 300	11.8	20.8	0.71	23.5	7.9
Belo Horizonte, Brazil	2 030	3 775	5 001	2.4	3.0	2.49	85.9	32.5
Belém, Brazil	804	1 473	2 004	0.9	1.2	2.62	83.2	36.0
Bengbu, China	461	797	1 323	0.1	0.2	2.73	72.7	66.0
Benghazi, Libyan Arab Jamahiriya	310	804	1 522	14.9	17.4	4.35	159.1	89.4
Benxi, China	713	1 042	1 643	0.1	0.3	2.11	46.1	57.7
Berlin, Germany	3 227	3 317	3 347	4.1	4.7	0.18	2.8	0.9
Bhopal, India	488	1 297	2 411	0.1	0.5	4.60	165.6	85.9
Bielefeld, Germany	1 127	1 262	1 325	1.5	1.8	0.98	11.9	5.0
Birmingham, United Kingdom	2 430	2 271	2 271	3.9	4.4	-0.26	-6.5	0.0
Bogotá, Colombia	3 036	6 079	8 394	17.0	23.4	2.95	100.2	38.1
Bombay, India	6 856	15 138	26 218	1.6	6.1	4.24	120.8	73.2

TABLE A.28 *(continued)*

Agglomeration and country	Population (millions) 1975	1995	2015	Population residing in agglomeration, 1995, as percentage of: Total population	Urban population	Annual growth rate, 1990-1995 (percentage)	Percentage increase between 1975 and 1995	1995 and 2015
Boston, United States of America	2 666	2 840	3 197	1.1	1.4	0.45	6.5	12.6
Brasília, Brazil	785	1 778	2 440	1.1	1.4	2.78	126.5	37.2
Brazzaville, Congo	338	1 004	2 064	38.7	66.3	4.75	196.8	105.6
Bremen, Germany	823	866	897	1.1	1.2	0.61	5.3	3.5
Brisbane, Australia	928	1 450	1 869	8.1	9.6	2.14	56.2	28.9
Brussels, Belgium	1 128	1 122	1 123	11.1	11.4	-0.46	-0.6	0.1
Bucharest, Romania	1 869	2 100	2 192	9.2	16.5	0.44	12.4	4.4
Budapest, Hungary	2 005	2 017	2 017	20.0	30.9	0.00	0.6	0.0
Buenos Aires, Argentina	9 144	11 802	13 856	33.9	38.5	1.15	29.1	17.4
Buffalo, United States of America	1 041	962	1 096	0.4	0.5	0.19	-7.6	14.0
Bursa, Turkey	345	1 045	1 820	1.7	2.5	4.80	203.2	74.2
Cairo, Egypt	6 079	9 690	14 418	15.6	35.0	2.31	59.4	48.8
Calcutta, India	7 888	11 923	17 305	1.3	4.8	1.81	51.2	45.1
Calgary, Canada	457	829	1 014	2.8	3.7	2.32	81.4	22.4
Cali, Colombia	1 044	1 870	2 600	5.2	7.2	2.51	79.1	39.0
Campinas, Brazil	671	1 607	2 357	1.0	1.3	3.65	139.6	46.6
Cape Town, South Africa	1 339	2 727	4 371	6.6	13.3	3.44	103.6	60.3
Caracas, Venezuela	2 342	3 007	3 777	13.8	16.0	0.95	28.4	25.6
Cartagena, Colombia	373	803	1 178	2.2	3.1	3.30	115.1	46.6
Casablanca, Morocco	1 768	3 101	4 835	11.7	22.6	2.62	75.4	55.9
Changchun, China	1 558	4 148	8 931	0.3	1.1	6.61	166.2	115.3
Changde, China	169	1 281	1 842	0.1	0.3	0.91	656.7	43.8
Changsha, China	942	1 516	2 471	0.1	0.4	2.63	60.9	63.0
Chelyabinsk, Russian Federation	966	1 180	1 183	0.8	1.0	0.46	22.2	0.3
Chengdu, China	2 076	4 324	7 840	0.4	1.2	4.32	108.3	81.3
Chicago, United States of America	6 749	6 844	7 458	2.6	3.4	0.15	1.4	9.0
Chittagong, Bangladesh	1 017	2 477	4 857	2.1	11.5	4.03	143.6	96.1
Chongqing, China	2 439	3 473	5 369	0.3	0.9	2.13	42.4	54.6
Cincinnati, United States of America	1 117	1 264	1 472	0.5	0.6	0.80	13.2	16.4
Ciudad Juárez, Mexico	474	966	1 473	1.1	1.4	3.80	103.6	52.5
Cleveland, United States of America	1 848	1 691	1 901	0.6	0.8	0.18	-8.5	12.5
Coimbatore, India	810	1 190	1 796	0.1	0.5	1.79	46.8	51.0
Cologne, Germany	2 633	2 984	3 108	3.7	4.2	0.89	13.3	4.2
Columbus, United States of America	813	1 007	1 198	0.4	0.5	1.20	23.9	19.0
Conakry, Guinea	373	1 558	3 527	21.2	72.6	6.56	317.9	126.3
Copenhagen, Denmark	1 381	1 326	1 326	25.4	29.8	-0.28	-4.0	0.0
Crakow, Poland	698	832	925	2.2	3.4	0.63	19.1	11.2
Curitiba, Brazil	1 077	2 240	3 106	1.4	1.8	2.98	108.0	38.7
Córdoba, Argentina	878	1 294	1 666	3.7	4.2	1.86	47.3	28.8
Dakar, Senegal	768	1 708	3 489	20.5	47.1	3.96	122.3	104.3
Dalian, China	1 396	2 578	4 704	0.2	0.7	4.27	84.7	82.4
Dallas, United States of America	2 234	3 609	4 380	1.4	1.8	2.29	61.6	21.3
Damascus, Syrian Arab Republic	1 122	2 036	3 500	14.3	27.4	2.58	81.4	71.9
Dandong, China	449	751	1 234	0.1	0.2	2.57	67.2	64.2
Daqing, China	605	1 177	2 029	0.1	0.3	3.32	94.4	72.4
Dar es Salaam, United Republic of Tanzania	638	1 747	3 789	5.8	24.0	3.93	173.9	116.9
Datong, China	877	1 519	2 636	0.1	0.4	3.47	73.2	73.5
Davao, Philippines	488	1 010	1 700	1.5	2.8	3.41	106.7	68.4
Delhi, India	4 426	9 948	16 860	1.1	4.0	3.85	124.8	69.5
Denver, United States of America	1 198	1 609	1 888	0.6	0.8	1.11	34.3	17.3
Detroit, United States of America	3 885	3 723	4 113	1.4	1.8	0.15	-4.2	10.5
Dhaka, Bangladesh	1 925	8 545	19 486	7.2	39.5	6.35	343.8	128.1
Dhanbad, India	526	883	1 345	0.1	0.4	1.84	68.0	52.3

TABLE A.28 *(continued)*

Agglomeration and country	Population (millions) 1975	1995	2015	Population residing in agglomeration, 1995, as percentage of: Total population	Urban population	Annual growth rate, 1990-1995 (percentage)	Percentage increase between 1975 and 1995	1995 and 2015
Dnepropetrovsk, Ukraine	981	1 231	1 250	2.4	3.4	0.63	25.5	1.6
Donetsk, Ukraine	963	1 150	1 162	2.2	3.2	0.50	19.5	1.0
Douala, Cameroon	380	1 320	2 894	10.0	22.4	5.52	247.3	119.3
Dublin, Ireland	833	911	973	25.7	44.7	-0.12	9.3	6.8
Durban, South Africa	894	1 264	1 907	3.0	6.2	2.44	41.3	50.9
Durg-Bhilainagar, India	330	798	1 368	0.1	0.3	3.40	141.9	71.4
Düsseldorf, Germany	2 590	3 030	3 363	3.7	4.3	2.31	17.0	11.0
East Rand, South Africa	943	1 691	3 009	4.1	8.3	4.73	79.4	78.0
Edmonton, Canada	543	887	1 008	3.0	3.9	1.34	63.4	13.6
Ekaterinburg, Russian Federation	1 135	1 420	1 429	1.0	1.3	0.58	25.2	0.6
Esfahan, Iran (Islamic Republic of)	767	1 924	4 641	2.8	4.8	7.44	150.9	141.3
Essen, Germany	6 448	6 482	6 596	7.9	9.2	0.40	0.5	1.8
Faisalabad, Pakistan	907	1 845	3 791	1.4	3.9	3.62	103.4	105.4
Faridabad, India	232	810	1 716	0.1	0.3	6.24	248.6	111.9
Florence, Italy	916	778	778	1.4	2.0	-1.06	-15.1	0.0
Fortaleza, Brazil	1 272	2 627	3 756	1.7	2.1	3.43	106.6	43.0
Fort Lauderdale, United States of America	797	1 364	1 657	0.5	0.7	1.83	71.2	21.5
Frankfurt, Germany	3 215	3 605	3 747	4.4	5.1	0.85	12.1	3.9
Fushun, China	1 082	1 526	2 353	0.1	0.4	1.89	41.1	54.2
Fuxin, China	572	813	1 257	0.1	0.2	1.79	42.0	54.7
Fuzhou, China	1 012	1 593	2 597	0.1	0.4	2.65	57.4	63.0
Gaziantep, Turkey	301	750	1 298	1.2	1.8	4.63	149.0	73.0
Gdansk, Poland	766	875	956	2.3	3.6	0.41	14.2	9.3
Genoa, Italy	1 086	890	890	1.6	2.3	-1.17	-18.1	0.0
Goiania, Brazil	516	1 006	1 346	0.6	0.8	2.31	95.0	33.8
Goteborg, Sweden	610	751	787	8.5	10.3	0.54	23.2	4.8
Guadalajara, Mexico	1 841	3 430	4 457	3.8	5.1	2.61	86.3	29.9
Guangzhou, China	3 102	4 492	7 234	0.4	1.2	2.73	44.8	61.0
Guatemala City, Guatemala	715	2 205	4 467	20.8	53.4	5.49	208.3	102.5
Guayaquil, Ecuador	886	1 831	2 959	16.0	27.1	3.06	106.6	61.6
Guiyang, China	1 140	1 925	3 188	0.2	0.5	2.91	68.9	65.6
Gujranwala, Pakistan	439	1 635	3 514	1.2	3.5	5.40	272.1	114.9
Gwalior, India	465	802	1 291	0.1	0.3	2.56	72.6	61.0
Hamburg, Germany	2 479	2 624	2 707	3.2	3.7	0.65	5.8	3.2
Handan, China	765	2 646	6 393	0.2	0.7	8.05	245.9	141.6
Hangzhou, China	1 097	4 207	11 407	0.3	1.1	9.70	283.5	171.1
Hanoi, Viet Nam	816	1 236	1 762	1.7	8.6	2.03	51.5	42.5
Hanover, Germany	1 210	1 267	1 307	1.6	1.8	0.58	4.7	3.2
Harare, Zimbabwe	529	1 410	3 164	12.6	39.7	5.95	166.7	124.3
Harbin, China	2 288	4 469	8 111	0.4	1.2	4.34	95.3	81.5
Havana, Cuba	1 827	2 221	2 422	20.3	26.7	1.02	21.6	9.0
Hefei, China	637	1 319	2 323	0.1	0.4	3.64	107.1	76.1
Helsinki, Finland	568	1 059	1 277	20.7	32.8	3.89	86.4	20.6
Hengyang, China	435	752	1 250	0.1	0.2	2.73	72.8	66.3
Hiroshima, Japan	505	889	931	0.7	0.9	1.08	76.0	4.8
Ho Chi Minh, Viet Nam	2 353	3 521	4 797	4.8	24.5	1.68	49.6	36.3
Hohhot, China	617	1 087	1 822	0.1	0.3	2.93	76.2	67.7
Hong Kong, China	3 943	5 817	6 325	95.0	100.0	1.60	47.5	8.7
Houston, United States of America	2 030	3 164	3 743	1.2	1.6	1.64	55.8	18.3
Hyderabad, India	2 086	5 477	10 489	0.6	2.2	5.34	162.6	91.5
Hyderabad, Pakistan	667	1 088	2 234	0.8	2.3	3.01	63.3	105.2
Ibadan, Nigeria	847	1 484	2 968	1.3	3.4	2.80	75.2	100.0
Inch'on, Republic of Korea	791	2 340	3 492	5.2	6.4	5.41	195.9	49.2

TABLE A.28 *(continued)*

Agglomeration and country	Population (millions) 1975	1995	2015	Population residing in agglomeration, 1995, as percentage of: Total population	Urban population	Annual growth rate, 1990-1995 (percentage)	Percentage increase between 1975 and 1995	1995 and 2015
Indianapolis, United States of America	829	959	1 129	0.4	0.5	0.91	15.8	17.7
Indore, India	663	1 258	2 062	0.1	0.5	2.91	89.7	63.9
Islamabad, Pakistan	107	813	1 870	0.6	1.7	7.55	662.8	130.1
Istanbul, Turkey	3 601	7 911	12 328	13.0	18.8	3.79	119.7	55.8
Izmir, Turkey	1 046	2 052	3 158	3.4	4.9	3.30	96.1	53.9
Jabalpur, India	621	953	1 424	0.1	0.4	1.60	53.5	49.4
Jacksonville, United States of America	564	816	1 005	0.3	0.4	1.89	44.5	23.3
Jaipur, India	778	1 808	3 200	0.2	0.7	4.03	132.4	77.0
Jakarta, Indonesia	4 814	8 621	13 923	4.4	12.3	2.39	79.1	61.5
Jamshedpur, India	538	910	1 416	0.1	0.4	2.14	69.2	55.7
Jeddah, Saudi Arabia	584	1 492	2 818	8.2	9.9	4.09	155.7	88.8
Jiamusi, China	393	921	1 709	0.1	0.2	4.25	134.1	85.5
Jilin, China	952	1 415	2 215	0.1	0.4	2.08	48.6	56.6
Jinan, China	1 236	3 467	7 900	0.3	0.9	7.32	180.5	127.8
Jinzhou, China	530	770	1 117	0.1	0.2	0.90	45.3	45.0
Jixi, China	656	882	1 291	0.1	0.2	1.07	34.3	46.5
Jodhpur, India	388	750	1 227	0.1	0.3	2.74	93.5	63.4
Johannesburg, South Africa	1 498	2 172	3 359	5.2	10.6	2.90	45.0	54.7
Kabul, Afghanistan	674	2 029	5 201	10.3	51.9	5.19	200.9	156.3
Kaifeng, China	536	755	1 164	0.1	0.2	1.72	40.9	54.1
Kampala, Uganda	399	954	2 548	4.8	38.6	4.69	139.0	167.1
Kanpur, India	1 420	2 227	3 412	0.2	0.9	2.14	56.8	53.2
Kansas City, United States of America	1 100	1 372	1 635	0.5	0.7	1.38	24.7	19.2
Kaohsiung, China	978	1 424	2 068	0.1	0.4	1.08	45.5	45.3
Karachi, Pakistan	3 983	9 733	19 377	7.1	20.8	4.06	144.4	99.1
Karlsruhe, Germany	861	954	999	1.2	1.4	0.90	10.9	4.7
Katowice, Poland	3 019	3 425	3 651	8.9	14.0	0.40	13.4	6.6
Kazan, Russian Federation	942	1 133	1 135	0.8	1.0	0.44	20.2	0.2
Kermanshah, Iran (Islamic Republic of)	274	756	1 561	1.1	1.9	5.13	176.0	106.4
Khartoum, Sudan	896	2 249	4 667	8.4	26.9	4.15	151.1	107.5
Kharkov, Ukraine	1 353	1 681	1 711	3.2	4.6	0.67	24.3	1.8
Khulna, Bangladesh	472	1 071	2 042	0.9	4.9	3.46	126.9	90.8
Kiev, Ukraine	1 926	2 812	2 939	5.4	7.7	1.27	46.0	4.5
Kinshasa, Democratic Republic of the Congo	1 735	4 241	9 430	9.3	32.5	4.16	144.5	122.3
Kishinev, Republic of Moldova	440	765	988	17.2	33.4	2.22	74.1	29.1
Kitakyushu, Japan	1 853	2 721	3 052	2.2	2.8	2.06	46.9	12.1
Kochi (Cochin), India	532	1 422	2 737	0.2	0.6	5.09	167.5	92.4
Kozhikode (Calic, India	412	946	1 670	0.1	0.4	3.83	129.4	76.5
Krasnoyarsk, Russian Federation	734	963	976	0.6	0.9	0.75	31.2	1.4
Kuala Lumpur, Malaysia	645	1 236	1 878	6.1	11.4	1.96	91.7	52.0
Kunming, China	1 223	1 741	2 607	0.1	0.5	1.53	42.3	49.8
Kuwait City, Kuwait	682	1 090	1 488	64.4	66.5	0.00	59.7	36.6
Kwangju, Republic of Korea	601	1 410	1 996	3.1	3.9	4.58	134.7	41.5
Kyoto, Japan	1 622	1 703	1 703	1.4	1.7	-0.07	4.9	0.0
Lagos, Nigeria	3 300	10 286	24 640	9.2	23.3	5.68	211.7	139.5
Lahore, Pakistan	2 399	5 012	10 047	3.7	10.7	3.64	109.0	100.4
Lanzhou, China	1 175	1 799	2 815	0.1	0.5	2.13	53.2	56.5
La Paz, Bolivia	610	1 250	2 125	16.9	27.9	3.61	105.1	69.9
Las Vegas, United States of America	325	863	1 165	0.3	0.4	4.02	165.5	35.1
Leeds, United Kingdom	1 508	1 433	1 433	2.5	2.8	-0.22	-5.0	0.0
León, Mexico	504	926	1 207	1.0	1.4	2.51	83.6	30.3
Liaoyang, China	329	798	1 504	0.1	0.2	4.43	142.4	88.4
Lille, France	943	976	1 021	1.7	2.2	0.33	3.4	4.6

TABLE A.28 *(continued)*

Agglomeration and country	Population (millions) 1975	1995	2015	Population residing in agglomeration, 1995, as percentage of: Total population	Urban population	Annual growth rate, 1990-1995 (percentage)	Percentage increase between 1975 and 1995	1995 and 2015
Lima, Peru	3 651	6 667	9 388	28.3	40.0	2.70	82.6	40.8
Lisbon, Portugal	1 168	1 863	2 271	19.0	53.3	2.33	59.5	21.9
Liuzhou, China	464	878	1 499	0.1	0.2	3.12	89.4	70.6
Liverpool, United Kingdom	818	877	944	1.5	1.7	1.07	7.2	7.7
Lodz, Poland	971	1 041	1 119	2.7	4.2	0.22	7.2	7.4
London, United Kingdom	8 169	7 640	7 640	13.2	14.7	-0.03	-6.5	0.0
Los Angeles, United States of America	8 926	12 410	14 217	4.6	6.1	1.60	39.0	14.6
Louisville, United States of America	751	762	874	0.3	0.4	0.20	1.6	14.7
Luanda, Angola	669	2 081	4 969	19.2	62.2	5.18	210.9	138.8
Lubumbashi, Democratic Republic of the Congo	390	810	1 861	1.8	6.2	3.77	107.4	129.7
Lucknow, India	892	2 078	3 959	0.2	0.8	5.05	132.9	90.6
Ludhiana, India	479	1 318	2 602	0.1	0.5	5.41	175.2	97.4
Luoyang, China	797	1 370	2 232	0.1	0.4	2.61	71.8	63.0
Lusaka, Zambia	385	1 317	2 923	16.3	37.9	6.03	242.5	121.9
Lvov, Ukraine	620	852	888	1.6	2.3	1.16	37.6	4.1
Lyon, France	1 185	1 319	1 400	2.3	3.0	0.82	11.3	6.2
Madras, India	3 609	6 002	9 173	0.6	2.4	2.34	66.3	52.8
Madrid, Spain	3 823	4 072	4 072	10.3	13.4	-0.48	6.5	0.0
Madurai, India	790	1 174	1 773	0.1	0.5	1.79	48.6	51.0
Managua, Nicaragua	493	1 124	1 912	27.3	43.9	3.53	128.2	70.1
Manaus, Brazil	434	1 199	1 879	0.8	1.0	4.46	176.3	56.7
Manchester, United Kingdom	2 425	2 252	2 252	3.9	4.3	-0.27	-7.1	0.0
Mannheim, Germany	1 422	1 570	1 640	1.9	2.2	0.88	10.4	4.4
Maputo, Mozambique	528	2 212	5 306	12.8	37.9	7.56	318.6	139.9
Maracaibo, Venezuela	825	1 603	2 447	7.3	8.5	3.41	94.3	52.7
Maracay, Venezuela	435	935	1 424	4.3	5.0	3.25	114.9	52.3
Marseille, France	1 194	1 234	1 269	2.1	2.8	0.06	3.4	2.9
Mashhad, Iran (Islamic Republic of)	685	2 016	3 656	2.9	5.0	3.63	194.1	81.4
Mecca, Saudi Arabia	378	777	1 432	4.3	5.1	3.18	105.7	84.2
Medan, Indonesia	1 031	1 699	2 746	0.9	2.4	2.01	64.8	61.6
Medellín, Colombia	1 267	3 291	4 835	9.2	12.7	4.06	159.8	46.9
Meerut, India	432	1 037	1 935	0.1	0.4	4.60	139.9	86.6
Melbourne, Australia	2 561	3 094	3 506	17.3	20.4	0.60	20.8	13.3
Memphis, United States of America	720	856	1 001	0.3	0.4	0.70	18.9	16.9
Mendoza, Argentina	534	851	1 143	2.4	2.8	2.32	59.3	34.2
Metro Manila, Philippines	5 000	9286	14 657	13.7	25.3	3.06	85.7	57.8
Mexico City, Mexico	11 236	16 562	19 180	18.2	24.7	1.81	47.4	15.8
Miami, United States of America	1 410	2 080	2 476	0.8	1.0	1.57	47.5	19.0
Milan, Italy	5 529	4 251	4 251	7.4	11.2	-1.59	-23.1	0.0
Milwaukee, United States of America	1 228	1 246	1 420	0.5	0.6	0.31	1.4	14.0
Minneapolis, United States of America	1 748	2 237	2 637	0.8	1.1	1.38	28.0	17.9
Minsk, Belarus	1 120	1 784	1 903	17.2	24.3	1.58	59.3	6.7
Mogadishu, Somalia	271	997	2 527	10.5	41.0	4.93	267.7	153.5
Monrovia, Liberia	226	962	2 609	45.3	100.8	7.24	325.1	171.3
Monterrey, Mexico	1 572	2 994	3 911	3.3	4.5	2.64	90.5	30.6
Montevideo, Uruguay	1 178	1 325	1 433	41.6	46.1	0.59	12.5	8.2
Montreal, Canada	2 792	3 306	3 675	11.2	14.7	1.36	18.4	11.2
Moscow, Russian Federation	7 623	9 269	9 299	6.2	8.2	0.48	21.6	0.3
Mosul, Iraq	397	879	1 568	4.4	5.9	3.33	121.5	78.4
Multan, Pakistan	599	1 236	2 569	0.9	2.6	3.69	106.5	107.9
Munich, Germany	1 957	2 237	2 339	2.7	3.2	0.94	14.3	4.6
Nagoya, Japan	2 293	3 213	3 516	2.6	3.3	1.73	40.1	9.4
Nagpur, India	1 075	1 851	2 912	0.2	0.7	2.45	72.2	57.4

TABLE A.28 *(continued)*

Agglomeration and country	Population (millions) 1975	1995	2015	Population residing in agglomeration, 1995, as percentage of: Total population	Urban population	Annual growth rate, 1990-1995 (percentage)	Percentage increase between 1975 and 1995	1995 and 2015
Nairobi, Kenya	677	1 810	4 228	6.7	23.3	5.09	167.4	133.6
Nanchang, China	896	1 406	2 216	0.1	0.4	2.16	56.9	57.6
Nanjing, China	1 938	2 961	4 728	0.2	0.8	2.52	52.8	59.7
Nanning, China	672	1 367	2 347	0.1	0.4	3.31	103.5	71.7
Naples, Italy	3 624	3 012	3 012	5.3	7.9	-1.28	-16.9	0.0
Nashik, India	330	911	1 788	0.1	0.4	5.25	175.6	96.4
Ndjamena, Chad	232	826	1 883	13.0	58.6	5.97	256.6	128.0
Neijiang, China	73	1 339	1 901	0.1	0.4	0.76	1735.9	42.0
New Orleans, United States of America	1 021	1 049	1 194	0.4	0.5	0.19	2.7	13.8
New York, United States of America	15 880	16 332	17 602	6.1	8.0	0.34	2.8	7.8
Nizhni Novgorod, Russian Federation	1 273	1 461	1 461	1.0	1.3	0.19	14.8	0.0
Norfolk, United States of America	720	1 680	2 285	0.6	0.8	4.51	133.3	36.0
Novosibirsk, Russian Federation	1 250	1 476	1 476	1.0	1.3	0.36	18.0	0.0
Nuremberg, Germany	1 034	1 160	1 218	1.4	1.6	0.96	12.2	5.0
Odessa, Ukraine	982	1 123	1 123	2.2	3.1	0.26	14.3	0.0
Oklahoma City, United States of America	628	845	1 019	0.3	0.4	1.41	34.6	20.6
Omsk, Russian Federation	933	1 204	1 215	0.8	1.1	0.65	29.0	0.9
Orlando, United States of America	427	1 075	1 422	0.4	0.5	3.63	152.0	32.2
Osaka, Japan	9 844	10 609	10 609	8.5	10.9	0.23	7.8	0.0
Ottawa, Canada	676	1 013	1 237	3.4	4.5	2.34	49.9	22.1
Ouagadougou, Burkina Faso	165	824	2 546	7.9	49.5	6.53	398.6	209.1
Palembang, Indonesia	597	1 212	2 154	0.6	1.7	3.20	103.0	77.7
Panama City, Panama	528	967	1 428	36.8	66.1	2.62	83.0	47.7
Paris, France	8 885	9 523	9 694	16.4	21.9	0.40	7.2	1.8
Patna, India	643	1 189	1 795	0.1	0.5	1.80	85.0	51.0
Perm, Russian Federation	937	1 117	1 117	0.8	1.0	0.34	19.2	0.0
Perth, Australia	770	1 220	1 522	6.8	8.1	1.66	58.4	24.8
Peshawar, Pakistan	347	1 649	3 602	1.2	3.5	6.12	374.6	118.5
Philadelphia, United States of America	4 069	4 302	4 780	1.6	2.1	0.36	5.7	11.1
Phoenix, United States of America	1 117	2 351	2 971	0.9	1.2	3.00	110.6	26.4
Pittsburgh, United States of America	1 827	1 690	1 902	0.6	0.8	0.18	-7.5	12.5
Port-au-Prince, Haiti	575	1 461	2 973	20.5	64.5	5.06	154.1	103.5
Port Elizabeth, South Africa	531	1 035	1 825	2.5	5.1	4.48	95.0	76.2
Portland, United States of America	925	1 252	1 487	0.5	0.6	1.25	35.3	18.7
Porto Alegre, Brazil	1 859	3 346	4 467	2.1	2.7	2.56	80.0	33.5
Prague, Czech Republic	1 125	1 225	1 240	11.9	18.2	0.24	8.9	1.2
Pretoria, South Africa	643	1 314	2 314	3.2	6.4	4.53	104.4	76.2
Providence, United States of America	796	877	1 024	0.3	0.4	0.68	10.2	16.8
Puch'on, Republic of Korea	105	953	1 705	2.1	2.6	7.62	805.3	78.8
Puebla, Mexico	850	1 722	2 271	1.9	2.6	2.67	102.6	31.9
Pune (Poona), India	1 345	2 955	5 143	0.3	1.2	3.91	119.7	74.0
Pusan, Republic of Korea	2 418	4 083	4 523	9.1	11.2	1.55	68.8	10.8
Pyongyang, Democratic People's Republic of Kor	1 348	2 484	3 289	11.2	18.4	1.98	84.2	32.4
Qingdao, China	1 106	3 138	7 292	0.3	0.9	7.56	183.8	132.4
Qiqihar, China	1 090	1 524	2 313	0.1	0.4	1.68	39.7	51.8
Quito, Ecuador	630	1 298	2 101	11.3	19.2	3.00	106.0	61.9
Rabat, Morocco	640	1 293	2 093	4.9	9.4	2.91	102.1	61.9
Rajkot, India	356	774	1 373	0.1	0.3	3.86	117.5	77.5
Rawalpindi, Pakistan	670	1 268	2 619	0.9	2.7	3.43	89.4	106.5
Recife, Brazil	2 042	3 080	3 899	1.9	2.5	1.83	50.8	26.6
Riga, Latvia	789	921	921	36.3	49.9	0.00	16.7	0.0
Rio de Janeiro, Brazil	7 854	10 181	11 860	6.4	8.2	1.00	29.6	16.5
Riverside-San Bernadino, United States of Ameri	645	1 465	1 975	0.5	0.7	4.24	127.3	34.8

TABLE A.28 *(continued)*

Agglomeration and country	Population (millions) 1975	1995	2015	Population residing in agglomeration, 1995, as percentage of Total population	Urban population	Annual growth rate, 1990-1995 (percentage)	Percentage increase between 1975 and 1995	1995 and 2015
Riyadh, Saudi Arabia	705	2 619	5 230	14.3	17.3	5.65	271.7	99.7
Rome, Italy	2 998	2 688	2 688	4.7	7.1	-0.86	-10.3	0.0
Rosario, Argentina	878	1 155	1 428	3.3	3.8	1.28	31.6	23.6
Rostov-on-Don, Russian Federation	874	1 048	1 048	0.7	0.9	0.36	19.9	0.0
Rotterdam, Netherlands	1 032	1 063	1 088	6.9	7.7	0.29	3.0	2.4
Saarland, Germany	908	888	902	1.1	1.3	0.22	-2.2	1.7
Sacramento, United States of America	714	1 269	1 608	0.5	0.6	2.75	77.6	26.7
Salt Lake City, United States of America	573	853	1 030	0.3	0.4	1.46	48.7	20.9
Salvador, Brazil	1 414	2 811	3 927	1.8	2.3	3.13	98.8	39.7
Samara, Russian Federation	1 146	1 260	1 260	0.8	1.1	0.00	9.9	0.0
San Antonio, United States of America	859	1 230	1 484	0.5	0.6	1.61	43.2	20.7
San Diego, United States of America	1 442	2 714	3 379	1.0	1.3	2.73	88.2	24.5
San Francisco, United States of America	3 093	3 864	4 461	1.4	1.9	1.19	24.9	15.5
San José, Costa Rica	526	920	1 526	26.9	54.5	2.96	75.1	65.9
San Jose, United States of America	1 135	1 539	1 825	0.6	0.8	1.32	35.6	18.6
San Juan, Puerto Rico	948	1 302	1 584	35.2	48.0	1.22	37.2	21.7
San Luis Potosí, Mexico	312	760	1 201	0.8	1.1	4.07	143.6	58.0
San Salvador, El Salvador	642	1 214	2 056	21.4	47.6	3.19	89.1	69.4
Santa Cruz, Bolivia	234	850	1 794	11.5	18.9	6.42	263.9	111.1
Santiago, Chile	3 247	4 891	6 066	34.4	41.0	1.71	50.6	24.0
Santiago de los, Dominican Republic	350	1 289	2 110	16.5	26.6	6.52	268.0	63.7
Santo Domingo, Dominican Republic	1 094	3 166	4 663	40.5	65.4	5.31	189.5	47.3
Santos, Brazil	771	1 173	1 501	0.7	0.9	1.75	52.2	28.0
São José dos Campos, Brazil	288	792	1 257	0.5	0.6	4.55	175.3	58.8
São Luis, Brazil	342	809	1 230	0.5	0.6	3.97	136.4	52.0
São Paulo, Brazil	10 047	16 533	20 320	10.4	13.3	1.84	64.6	22.9
Sapporo, Japan	978	1 710	1 930	1.4	1.8	2.12	74.8	12.8
Saratov, Russian Federation	816	917	917	0.6	0.8	0.12	12.4	0.0
Sasolburg, South Africa	372	1 002	1 976	2.4	4.9	5.98	169.6	97.3
Seattle, United States of America	1 316	1 937	2 351	0.7	1.0	1.98	47.1	21.4
Semarang, Indonesia	660	795	1 121	0.4	1.1	-0.21	20.5	41.0
Sendai, Japan	635	801	839	0.6	0.8	1.05	26.1	4.6
Seoul, Republic of Korea	6 808	11 609	12 980	25.9	31.8	1.92	70.5	11.8
Shanghai, China	11 443	13 584	17 969	1.1	3.7	0.36	18.7	32.3
Shantou, China	606	1 004	1 634	0.1	0.3	2.52	65.7	62.8
Shenyang, China	3 697	5 116	7 715	0.4	1.4	1.89	38.4	50.8
Shenzhen, China	19	947	1 439	0.1	0.3	1.58	4874.1	51.9
Shijiazhuang, China	940	1 604	2 709	0.1	0.4	3.12	70.7	68.9
Shiraz, Iran (Islamic Republic of)	418	1 023	1 610	1.5	2.5	1.56	144.7	57.4
Shubra El-Khemia, Egypt	353	1 204	2 449	1.9	4.3	6.00	240.8	103.4
Singapore, Singapore	2 263	3 327	4 009	****	100.0	1.96	47.1	20.5
Sofia, Bulgaria	960	1 188	1 188	14.0	20.5	-0.04	23.7	0.0
St. Louis, United States of America	1 865	2 007	2 291	0.8	1.0	0.59	7.6	14.1
Stockholm, Sweden	1 224	1 545	1 626	17.6	21.2	0.73	26.3	5.2
St. Petersburg, Russian Federation	4 326	5 132	5 132	3.5	4.6	0.31	18.6	0.0
Stuttgart, Germany	2 300	2 608	2 728	3.2	3.7	0.97	13.4	4.6
Surabaja, Indonesia	1 471	2 253	3 558	1.1	3.2	1.77	53.1	58.0
Surat, India	642	1 893	3 623	0.2	0.8	5.08	194.8	91.4
Suwon, Republic of Korea	220	939	1 737	2.1	2.6	8.07	326.1	84.9
Suzhou, China	619	1 069	1 878	0.1	0.3	3.55	72.7	75.7
Sydney, Australia	2 960	3 590	3 990	20.1	23.7	0.37	21.3	11.1
Tabora, United Republic of Tanzania	40	960	3 155	3.2	13.2	13.14	2324.8	228.7
Tabriz, Iran (Islamic Republic of)	662	1 452	2 394	2.1	3.6	2.27	119.4	64.9

TABLE A.28 *(continued)*

Agglomeration and country	Population (millions) 1975	1995	2015	Population residing in agglomeration, 1995, as percentage of: Total population	Urban population	Annual growth rate, 1990-1995 (percentage)	Percentage increase between 1975 and 1995	1995 and 2015
Taegu, Republic of Korea	1 297	2 432	2 785	5.4	6.7	1.87	87.5	14.5
Taejon, Republic of Korea	501	1 256	1 685	2.8	3.4	3.84	150.5	34.2
Taipei, China	1 835	2 669	3 854	0.2	0.7	1.15	45.4	44.4
Taiyuan, China	1 519	2 100	3 079	0.2	0.6	1.29	38.2	46.6
Tampa, United States of America	1 094	1 903	2 317	0.7	0.9	2.04	74.0	21.7
Tangshan, China	1 198	1 535	2 158	0.1	0.4	0.66	28.1	40.7
Tashkent, Uzbekistan	1 612	2 282	3 518	10.0	24.4	1.58	41.6	54.2
Tbilisi, Georgia	993	1 342	1 525	24.6	42.2	0.99	35.3	13.6
Tegucigalpa, Honduras	298	995	2 016	17.6	40.2	5.17	234.2	102.6
Teheran, Iran (Islamic Republic of)	4 274	6 836	10 309	10.0	17.0	1.44	60.0	50.8
Tel-Aviv-Yafo, Israel	1 206	1 976	2 580	35.8	39.4	1.98	63.9	30.6
Thane, India	272	1 099	2 494	0.1	0.4	7.23	304.5	126.9
Thessaloniki, Greece	617	987	1 191	9.4	15.9	2.35	60.1	20.6
Thiruvananthapur, India	454	1 010	1 889	0.1	0.4	4.63	122.5	87.1
Tianjin, China	6 160	9 415	13 530	0.8	2.6	1.38	52.8	43.7
Tijuana, Mexico	349	910	1 604	1.0	1.4	4.98	160.8	76.3
Tiruchchirapalli, India	522	761	1 138	0.1	0.3	1.55	45.9	49.5
Tokyo, Japan	19 771	26 959	28 887	21.6	27.6	1.45	36.4	7.2
Toluca, Mexico	172	803	1 997	0.9	1.2	7.78	367.8	148.8
Toronto, Canada	2 770	4 319	5 220	14.7	19.2	2.55	55.9	20.9
Torreón, Mexico	409	814	1 148	0.9	1.2	3.15	99.2	41.0
Tripoli, Libyan Arab Jamahiriya	611	1 682	3 137	31.1	36.4	4.48	175.4	86.5
Tunis, Tunisia	868	1 722	2 500	19.2	30.9	1.87	98.3	45.2
Turin, Italy	1 641	1 294	1 294	2.3	3.4	-1.49	-21.2	0.0
Tyneside (Newcastle), United Kingdom	838	934	1 019	1.6	1.8	1.24	11.4	9.1
Ufa, Russian Federation	887	1 131	1 138	0.8	1.0	0.56	27.6	0.6
Ujung Pandang, Indonesia	502	926	1 572	0.5	1.3	2.53	84.4	69.8
Ulhasnagar, India	490	1 322	2 525	0.1	0.5	4.97	170.1	91.0
Ulsan, Republic of Korea	246	833	1 164	1.9	2.3	4.28	238.2	39.7
Urumqi, China	717	1 306	2 091	0.1	0.4	2.36	82.0	60.1
Vadodara, India	571	1 348	2 420	0.1	0.5	4.14	136.2	79.5
Valencia, Spain	897	751	758	1.9	2.5	0.06	-16.2	0.9
Valencia, Venezuela	519	1 462	2 548	6.7	7.8	5.17	181.6	74.3
Vancouver, Canada	1 150	1 809	2 293	6.2	8.0	2.98	57.3	26.7
Varanasi (Benare, India	682	1 152	1 845	0.1	0.5	2.57	69.0	60.1
Vienna, Austria	2 001	2 060	2 108	25.6	39.8	0.06	3.0	2.3
Vijayawada, India	419	1 025	1 889	0.1	0.4	4.43	144.7	84.3
Visakhapatnam, India	452	1 348	2 698	0.1	0.5	5.60	198.3	100.2
Volgograd, Russian Federation	884	1 022	1 021	0.7	0.9	0.25	15.6	0.0
Voronezh, Russian Federation	732	930	939	0.6	0.8	0.66	27.1	0.9
Warsaw, Poland	1 907	2 219	2 400	5.8	9.0	0.49	16.4	8.2
Washington, D.C., United States of America	2 626	3 685	4 361	1.4	1.8	1.73	40.3	18.4
Wenzhou, China	327	1 159	2 500	0.1	0.3	6.33	254.8	115.8
West Palm Beach, United States of America	379	989	1 337	0.4	0.5	4.12	160.7	35.3
West Rand, South Africa	489	1 076	1 960	2.6	5.3	4.92	120.1	82.1
Wuhan, China	2 926	4 247	6 509	0.3	1.2	2.05	45.2	53.2
Wuxi, China	730	967	1 443	0.1	0.3	1.34	32.4	49.2
Xian, China	1 939	2 966	4 661	0.2	0.8	2.31	53.0	57.2
Xining, China	480	791	1 290	0.1	0.2	2.49	64.7	63.2
Xuzhou, China	667	1 463	2 815	0.1	0.4	4.85	119.5	92.3
Yangon, Myanmar	1 760	3 873	6 775	8.6	33.2	2.99	120.1	74.9
Yaoundé, Cameroon	276	1 119	2 533	8.5	19.0	6.15	305.3	126.3
Yerevan, Armenia	911	1 278	1 478	35.2	51.3	1.09	40.3	15.6

TABLE A.28 *(continued)*

Agglomeration and country	Population (millions)			Population residing in agglomeration, 1995, as percentage of		Annual growth rate, 1990-1995 (percentage)	Percentage increase between	
	1975	1995	2015	Total population	Urban population		1975 and 1995	1995 and 2015
Yichun, China	664	856	1 201	0.1	0.2	0.49	29.0	40.3
Yueyang, China	903	1 143	1 680	0.1	0.3	1.18	26.6	46.9
Zagreb, Croatia	605	981	1 148	21.8	39.1	2.90	62.3	17.0
Zaporozhye, Ukraine	730	933	957	1.8	2.6	0.82	27.8	2.5
Zhangjiakou, China	521	801	1 274	0.1	0.2	2.15	53.8	59.0
Zhengzhou, China	1 227	1 991	3 211	0.2	0.5	2.56	62.3	61.2
Zurich, Switzerland	713	909	1 108	12.7	20.8	1.73	27.5	21.8

Source: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, *World Urbanization Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.XIII.6).

TABLE A.29. FERTILITY TRENDS, MAJOR AREAS, REGIONS AND COUNTRIES, 1970-1995, AND GOVERNMENTS' VIEWS ON FERTILITY

Major area, region or country	Total fertility rate (per woman) 1970-1975	Total fertility rate (per woman) 1990-1995	Annual percentage change, 1970-1975 to 1990-1995	View on fertility and type of intervention to modify fertility
World total	4.48	2.96	-2.1	
More developed regions[a]	2.11	1.68	-1.1	
Less developed regions[b]	5.42	3.30	-2.5	
Least developed countries	6.70	5.54	-1.0	
Africa	6.57	5.71	-0.7	
Eastern Africa	6.96	6.35	-0.5	
Burundi	6.80	6.80	-0.0	Too high: intervene to lower
Comoros	7.05	6.00	-0.8	Too high: intervene to lower
Djibouti	6.70	5.80	-0.7	Satisfactory: no intervention
Eritrea	6.20	5.80	-0.3	Too high: intervene to lower
Ethiopia	6.80	7.00	0.1	Too high: intervene to lower
Kenya	8.12	5.40	-2.0	Too high: intervene to lower
Madagascar	6.60	6.10	-0.4	Too high: intervene to lower
Malawi	7.40	7.20	-0.1	Too high: intervene to lower
Mauritius	3.25	2.35	-1.6	Satisfactory: intervene to maintain
Mozambique	6.50	6.50	0.0	Too high: intervene to lower
Réunion	3.93	2.43	-2.4	..
Rwanda	8.29	6.55	-1.2	Too high: intervene to lower
Somalia	7.00	7.00	0.0	Satisfactory: no intervention
Uganda	6.90	7.10	0.1	Too high: intervene to lower
United Republic of Tanzania	6.80	5.90	-0.7	Too high: intervene to lower
Zambia	6.90	5.98	-0.7	Too high: intervene to lower
Zimbabwe	7.20	5.20	-1.6	Too high: intervene to lower
Middle Africa	6.25	6.44	0.1	
Angola	6.60	7.20	0.4	Too high: no intervention
Cameroon	6.30	5.70	-0.5	Too high: intervene to lower
Central African Republic	5.72	5.30	-0.4	Too high: no intervention
Chad	5.99	5.89	-0.1	Satisfactory: no intervention
Congo	6.29	6.29	-0.0	Too high: intervene to lower
Democratic Republic of the Congo	6.30	6.70	0.3	Satisfactory: no intervention
Equatorial Guinea	5.68	5.89	0.2	Satisfactory: intervene to maintain
Gabon	4.26	5.00	0.8	Too low: intervene to raise
Northern Africa	6.33	4.12	-2.1	
Algeria	7.38	4.30	-2.7	Too high: intervene to lower
Egypt	5.54	3.80	-1.9	Too high: intervene to lower
Libyan Arab Jamahiriya	7.59	6.39	-0.9	Satisfactory: no intervention
Morocco	6.89	3.75	-3.0	Too high: intervene to lower
Sudan	6.67	5.00	-1.4	Too high: intervene to lower
Tunisia	6.18	3.25	-3.2	Too high: intervene to lower
Western Sahara	6.53	4.45	-1.9	..
Southern Africa	5.56	4.21	-1.4	
Botswana	6.60	4.85	-1.5	Too high: intervene to lower
Lesotho	5.74	5.20	-0.5	Too high: intervene to lower
Namibia	6.00	5.25	-0.7	Too high: no intervention
South Africa	5.49	4.10	-1.5	Too high: intervene to lower
Swaziland	6.50	4.86	-1.5	Too high: intervene to lower

TABLE A.29 *(continued)*

Major area, region or country	Total fertility rate (per woman) 1970-1975	1990-1995	Annual percentage change, 1970-1975 to 1990-1995	View on fertility and type of intervention to modify fertility
Western Africa	6.75	6.43	-0.2	
Benin	7.06	6.30	-0.6	Satisfactory: no intervention
Burkina Faso	7.80	7.10	-0.5	Too high: intervene to lower
Cape Verde	7.00	3.88	-3.0	Too high: intervene to lower
Côte d'Ivoire	7.41	5.70	-1.3	Satisfactory: intervene to raise
Gambia	6.50	5.60	-0.7	Too high: intervene to lower
Ghana	6.64	5.70	-0.8	Too high: intervene to lower
Guinea	7.00	7.00	-0.0	Too high: intervene to lower
Guinea-Bissau	5.38	5.79	0.4	Too high: no intervention
Liberia	6.80	6.80	-0.0	Too high: intervene to lower
Mali	7.11	7.10	-0.0	Too high: intervene to lower
Mauritania	6.50	5.40	-0.9	Satisfactory: no intervention
Niger	8.12	7.40	-0.5	Too high: intervene to lower
Nigeria	6.45	6.45	0.0	Too high: intervene to lower
Senegal	7.00	6.06	-0.7	Too high: intervene to lower
Sierra Leone	6.50	6.50	0.0	Too high: intervene to lower
Togo	6.58	6.58	0.0	Satisfactory: intervene to maintain
Asia	5.09	2.84	-2.9	
Eastern Asia	4.49	1.88	-4.4	
China	4.86	1.92	-4.6	Satisfactory: intervene to lower
Democratic People's Republic of Korea	5.69	2.10	-5.0	Satisfactory: intervene to maintain
Hong Kong, China	2.89	1.32	-3.9	..
Japan	2.07	1.48	-1.7	Too low: no intervention
Macau	3.20	1.60	-3.5	..
Mongolia	7.33	3.56	-3.6	Satisfactory: intervene to maintain
Republic of Korea	4.28	1.65	-4.8	Satisfactory: no intervention
South-central Asia	5.72	3.74	-2.1	
Afghanistan	7.14	6.90	-0.2	Too high: no intervention
Bangladesh	7.02	3.40	-3.6	Too high: intervene to lower
Bhutan	5.90	5.89	-0.0	Satisfactory: no intervention
India	5.43	3.39	-2.4	Too high: intervene to lower
Iran (Islamic Republic of)	6.54	5.30	-1.1	Too high: intervene to lower
Kazakhstan	3.45	2.51	-1.6	Satisfactory: intervene to maintain
Kyrgyzstan	4.73	3.58	-1.4	Satisfactory: intervene to maintain
Maldives	7.00	6.80	-0.1	Too high: intervene to lower
Nepal	6.30	5.43	-0.7	Too high: intervene to lower
Pakistan	7.00	5.51	-1.2	Too high: intervene to lower
Sri Lanka	4.00	2.20	-3.0	Too high: intervene to lower
Tajikistan	6.83	4.30	-2.3	Too high: intervene to lower
Turkmenistan	6.19	3.95	-2.2	Satisfactory: intervene to maintain
Uzbekistan	6.01	3.83	-2.3	Satisfactory: intervene to maintain
South-eastern Asia	5.31	3.15	-2.6	
Brunei Darussalam	5.40	3.00	-2.9	Satisfactory: no intervention
Cambodia	5.54	4.90	-0.6	Too high: intervene to lower
East Timor	6.15	4.77	-1.3	..
Indonesia	5.10	2.90	-2.8	Too high: intervene to lower
Lao People's Democratic Republic	6.15	6.69	0.4	Satisfactory: intervene to maintain

TABLE A.29 *(continued)*

Major area, region or country	Total fertility rate (per woman) 1970-1975	1990-1995	Annual percentage change, 1970-1975 to 1990-1995	View on fertility and type of intervention to modify fertility
Malaysia	5.15	3.62	-1.8	Too high: intervene to lower
Myanmar	5.75	3.60	-2.3	Too high: no intervention
Philippines	5.50	4.00	-1.6	Too high: intervene to lower
Singapore	2.62	1.79	-1.9	Too low: intervene to raise
Thailand	4.99	1.94	-4.7	Too high: intervene to lower
Viet Nam	5.85	3.40	-2.7	Too high: intervene to lower
Western Asia	5.57	4.06	-1.6	
Armenia	3.04	2.17	-1.7	Satisfactory: intervene to raise
Azerbaijan	4.29	2.60	-2.5	Satisfactory: intervene to maintain
Bahrain	5.95	3.40	-2.8	Satisfactory: intervene to lower
Cyprus	2.49	2.38	-0.2	Too low: intervene to raise
Gaza Strip	7.60	8.80	0.7	..
Georgia	2.60	2.10	-1.1	Too low: intervene to raise
Iraq	7.11	5.70	-1.1	Too low: intervene to raise
Israel	3.77	2.93	-1.3	Too low: intervene to raise
Jordan	7.79	5.57	-1.7	Too high: intervene to lower
Kuwait	6.90	3.10	-4.0	Satisfactory: intervene to maintain
Lebanon	4.92	3.09	-2.3	Satisfactory: no intervention
Oman	7.20	7.20	0.0	Satisfactory: intervene to maintain
Qatar	6.77	4.10	-2.5	Satisfactory: intervene to maintain
Saudi Arabia	7.30	6.37	-0.7	Satisfactory: intervene to maintain
Syrian Arab Republic	7.69	4.70	-2.5	Satisfactory: no intervention
Turkey	5.04	2.70	-3.1	Too high: intervene to lower
United Arab Emirates	6.36	3.80	-2.6	Satisfactory: no intervention
Yemen	7.61	7.60	-0.0	Too high: intervene to lower
Europe	2.14	1.57	-1.6	
Eastern Europe	2.11	1.62	-1.3	
Belarus	2.24	1.67	-1.5	Satisfactory: intervene to raise
Bulgaria	2.17	1.53	-1.7	Too low: intervene to raise
Czech Republic	2.21	1.68	-1.4	Satisfactory: no intervention
Hungary	2.08	1.69	-1.0	Too low: intervene to raise
Poland	2.25	1.89	-0.9	Satisfactory: no intervention
Republic of Moldova	2.56	2.15	-0.9	Satisfactory: intervene to maintain
Romania	2.63	1.50	-2.8	Too low: intervene to raise
Russian Federation	1.98	1.53	-1.3	Too low: no intervention
Slovakia	2.51	1.85	-1.5	Satisfactory: intervene to maintain
Ukraine	2.04	1.64	-1.1	Too low: intervene to raise
Northern Europe	2.08	1.81	-0.7	
Denmark	1.97	1.75	-0.6	Satisfactory: no intervention
Estonia	2.15	1.58	-1.5	Too low: intervene to raise
Finland	1.62	1.83	0.6	Satisfactory: intervene to raise
Iceland	2.84	2.19	-1.3	Satisfactory: no intervention
Ireland	3.80	2.01	-3.2	Satisfactory: intervene to maintain
Latvia	2.00	1.64	-1.0	Too low: intervene to raise
Lithuania	2.32	1.78	-1.3	Satisfactory: intervene to raise
Norway	2.25	1.88	-0.9	Satisfactory: no intervention
Sweden	1.89	2.01	0.3	Satisfactory: no intervention

TABLE A.29 *(continued)*

Major area, region or country	Total fertility rate (per woman) 1970-1975	Total fertility rate (per woman) 1990-1995	Annual percentage change, 1970-1975 to 1990-1995	View on fertility and type of intervention to modify fertility
United Kingdom	2.04	1.78	-0.7	Satisfactory: no intervention
Southern Europe	2.53	1.40	-3.0	
Albania	4.66	2.85	-2.5	Satisfactory: intervene to maintain
Bosnia and Herzegovina	2.63	1.50	-2.8	Satisfactory: intervene to maintain
Croatia	1.96	1.65	-0.9	Too low: intervene to raise
Greece	2.32	1.38	-2.6	Too low: intervene to raise
Italy	2.28	1.24	-3.0	Satisfactory: no intervention
Malta	2.07	2.08	0.0	Satisfactory: no intervention
Portugal	2.76	1.52	-3.0	Too low: no intervention
Slovenia	2.19	1.36	-2.4	Too low: no intervention
Spain	2.89	1.27	-4.1	Satisfactory: no intervention
The former Yugoslav Republic of Macedoni	2.95	2.10	-1.7	Too high: intervene to lower
Yugoslavia	2.36	1.93	-1.0	Satisfactory: intervene to maintain
Western Europe	1.92	1.49	-1.3	
Austria	2.02	1.47	-1.6	Satisfactory: no intervention
Belgium	1.94	1.62	-0.9	Satisfactory: no intervention
France	2.31	1.70	-1.5	Too low: intervene to raise
Germany	1.64	1.30	-1.2	Too low: no intervention
Luxembourg	1.96	1.66	-0.8	Too low: intervene to raise
Netherlands	1.97	1.59	-1.1	Satisfactory: no intervention
Switzerland	1.81	1.53	-0.9	Too low: no intervention
Latin America and the Caribbean	5.01	2.93	-2.7	
Caribbean	4.37	2.70	-2.4	
Bahamas	2.99	1.95	-2.1	Satisfactory: no intervention
Barbados	2.74	1.73	-2.3	Satisfactory: no intervention
Cuba	3.55	1.60	-4.0	Satisfactory: no intervention
Dominican Republic	5.63	3.09	-3.0	Too high: intervene to lower
Guadeloupe	4.49	2.14	-3.7	..
Haiti	5.76	4.79	-0.9	Too high: intervene to lower
Jamaica	5.00	2.61	-3.3	Too high: intervene to lower
Martinique	4.08	2.05	-3.4	..
Netherlands Antilles	2.65	2.20	-0.9	..
Puerto Rico	2.99	2.18	-1.6	..
Trinidad and Tobago	3.45	2.29	-2.0	Too high: intervene to lower
Central America	6.43	3.41	-3.2	
Belize	6.25	4.18	-2.0	Too high: no intervention
Costa Rica	4.34	3.14	-1.6	Too high: intervene to lower
El Salvador	6.10	3.50	-2.8	Too high: intervene to lower
Guatemala	6.45	5.36	-0.9	Too high: intervene to lower
Honduras	7.05	4.92	-1.8	Too high: intervene to lower
Mexico	6.52	3.12	-3.7	Too high: intervene to lower
Nicaragua	6.79	4.41	-2.2	Too high: intervene to lower
Panama	4.94	2.88	-2.7	Satisfactory: no intervention
South America	4.62	2.78	-2.5	
Argentina	3.15	2.83	-0.5	Satisfactory: no intervention
Bolivia	6.50	4.80	-1.5	Satisfactory: no intervention
Brazil	4.72	2.44	-3.3	Satisfactory: no intervention

TABLE A.29 *(continued)*

Major area, region or country	Total fertility rate (per woman) 1970-1975	1990-1995	Annual percentage change, 1970-1975 to 1990-1995	View on fertility and type of intervention to modify fertility
Chile	3.63	2.54	-1.8	Satisfactory: intervene to maintain
Colombia	4.67	2.92	-2.3	Satisfactory: no intervention
Ecuador	6.00	3.52	-2.7	Too high: intervene to lower
Guyana	4.90	2.55	-3.3	Satisfactory: no intervention
Paraguay	5.65	4.55	-1.1	Satisfactory: no intervention
Peru	6.00	3.43	-2.8	Too high: intervene to lower
Suriname	5.29	2.68	-3.4	Satisfactory: no intervention
Uruguay	3.00	2.33	-1.3	Too low: intervene to raise
Venezuela	4.94	3.29	-2.0	Satisfactory: intervene to lower
Northern America	2.01	2.02	0.0	
Canada	1.97	1.74	-0.6	Satisfactory: no intervention
United States of America	2.02	2.05	0.1	Satisfactory: no intervention
Oceania	3.21	2.51	-1.2	
Australia-New Zealand	2.58	1.93	-1.5	
Australia	2.53	1.89	-1.5	Satisfactory: no intervention
New Zealand	2.80	2.12	-1.4	Satisfactory: no intervention
Melanesia	5.78	4.68	-1.1	
Fiji	4.20	2.98	-1.7	Too high: intervene to lower
New Caledonia	4.94	2.74	-2.9	..
Papua New Guinea	6.08	5.05	-0.9	Too high: intervene to lower
Solomon Islands	7.23	5.39	-1.5	Too high: intervene to lower
Vanuatu	6.50	4.68	-1.6	Satisfactory: no intervention
Micronesia	5.90	4.40	-1.5	
Guam	4.12	3.35	-1.0	..
Polynesia	6.08	3.53	-2.7	
French Polynesia	5.15	3.05	-2.6	..
Samoa	6.93	4.20	-2.5	Too high: intervene to lower

Source: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, *World Urbanization Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.XIII.6).

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

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

TABLE A.30. AGE PATTERN OF FERTILITY, MAJOR AREAS, REGIONS AND COUNTRIES, 1990-1995

Major area, region or country	Total fertilit (per woman)	Age-specific fertility rate (per 1,000 women) for age group 15-19	20-24	25-29	30-34	35-39	40-44	45-49	Births (thousands)	Percentage of births to women: Under age 20	Aged 35 years or over
World total	2.96	66.2	178.6	166.8	101.5	51.1	20.6	6.7	660 454	13	10
More developed regions[a]	1.68	32.5	94.5	108.3	70.6	25.7	4.6	0.3	71 703	9	9
Less developed regions[b]	3.30	73.1	197.2	182.2	111.4	60.0	26.8	9.4	588 750	13	10
Least developed countries	5.54	138.4	259.6	254.9	206.4	142.2	77.9	28.5	109 867	18	14
Africa	5.71	129.8	259.7	264.4	218.0	151.2	83.3	35.4	138 847	16	15
Eastern Africa	6.35	144.5	299.5	290.6	238.6	164.5	96.5	36.3	46 945	17	14
Burundi	6.80	59.8	251.6	301.9	278.8	225.8	133.3	108.8	1 324	7	24
Comoros	6.00	142.1	306.7	304.8	216.6	152.8	62.8	14.2	122	17	11
Djibouti	5.80	31.3	150.8	261.0	309.7	249.4	117.2	40.6	109	4	26
Eritrea	5.80	140.3	288.0	277.0	230.8	118.1	78.3	27.5	651	17	12
Ethiopia	7.00	169.4	343.0	329.0	281.4	144.2	98.0	35.0	12 785	17	13
Kenya	5.40	110.2	257.0	240.8	197.6	154.4	70.2	49.7	4 770	17	14
Madagascar	6.10	155.1	281.6	283.7	222.3	180.1	80.9	16.3	3 004	18	15
Malawi	7.20	172.8	316.8	299.4	269.2	203.4	121.0	57.5	2 406	18	17
Mauritius	2.35	46.1	149.9	137.2	82.3	41.4	11.8	1.4	113	11	10
Mozambique	6.50	131.3	306.8	279.5	196.3	176.8	159.9	49.4	3 550	15	20
Réunion	2.43	42.3	128.3	147.7	106.4	43.3	17.5	0.5	68	9	9
Rwanda	6.55	60.2	251.2	364.1	285.3	201.2	112.0	36.1	1 332	8	17
Somalia	7.00	208.3	330.7	306.9	249.7	177.6	99.4	27.4	2 275	21	14
Uganda	7.10	180.3	336.5	323.8	271.2	200.2	85.2	22.7	4 619	19	13
United Republic of Tanzania	5.90	133.8	284.7	273.0	211.3	155.0	91.0	31.3	5 992	17	14
Zambia	5.98	144.5	290.3	273.8	217.5	163.5	83.0	23.3	1 687	19	13
Zimbabwe	5.20	129.0	248.6	223.6	192.4	149.8	73.8	22.9	2 128	18	14
Middle Africa	6.44	206.3	304.4	270.9	228.9	162.8	88.4	25.5	17 734	23	14
Angola	7.20	236.4	338.8	301.3	256.5	182.0	103.8	21.2	2 546	24	14
Cameroon	5.70	140.7	272.1	253.2	213.7	159.6	81.3	19.5	2 500	18	15
Central African Republic	5.30	147.1	244.4	234.9	186.6	124.6	52.4	70.0	608	20	15
Chad	5.89	192.0	293.3	260.3	202.6	137.8	73.0	18.8	1 293	22	13
Congo	6.29	145.9	264.2	283.1	254.1	186.2	94.4	30.2	539	17	16
Democratic Republic of the Congo	6.70	230.5	316.2	274.7	234.5	166.2	92.5	25.5	9 967	24	13
Equatorial Guinea	5.89	192.0	293.3	260.3	202.6	137.8	73.0	18.8	82	22	14
Gabon	5.00	158.7	241.9	192.5	174.7	129.4	78.7	24.0	178	21	18
Northern Africa	4.12	49.8	176.4	220.8	181.5	122.9	56.3	17.0	22 786	8	17
Algeria	4.30	25.8	147.1	209.8	209.8	170.3	80.0	17.2	4 081	5	21
Egypt	3.80	62.3	205.2	217.4	148.2	85.1	35.0	6.8	8 478	10	13
Libyan Arab Jamahiriya	6.39	109.5	279.3	312.6	272.1	189.7	95.0	19.9	1 042	14	16
Morocco	3.75	37.0	138.0	210.8	167.2	113.4	59.3	24.3	3 646	7	18
Sudan	5.00	59.0	182.0	234.0	232.0	174.0	83.0	36.0	4 403	9	21
Tunisia	3.25	16.9	111.2	195.0	165.1	113.8	41.0	7.2	1 098	3	18
Western Sahara	4.45	65.5	177.7	252.5	188.9	122.1	58.3	25.0	38	11	15

TABLE A.30 *(continued)*

Major area, region or country	Total fertilit (per woman)	Age-specific fertility rate (per 1,000 women) for age group 15-19	20-24	25-29	30-34	35-39	40-44	45-49	Births (thousands)	Percentage of births to women Under age 20	Aged 35 years or over
Southern Africa	4.21	75.4	199.1	216.6	164.3	97.4	62.0	27.3	7 154	12	16
Botswana	4.85	100.2	208.2	244.6	192.3	131.6	64.9	27.5	253	15	14
Lesotho	5.20	91.1	246.3	242.4	212.6	148.7	70.9	27.9	352	13	17
Namibia	5.25	110.7	226.0	253.2	196.1	147.8	87.3	28.9	271	15	17
South Africa	4.10	72.1	194.9	212.9	159.7	91.7	60.6	27.0	6 123	12	16
Swaziland	4.86	88.4	228.7	224.4	186.9	136.5	69.7	36.6	155	14	15
Western Africa	6.43	158.3	280.5	282.4	238.0	172.9	97.5	55.5	44 228	18	16
Benin	6.30	143.6	293.6	315.0	233.1	173.9	74.3	26.5	1 138	16	14
Burkina Faso	7.10	156.8	299.9	298.9	268.0	228.9	115.2	52.4	2 331	17	17
Cape Verde	3.88	84.6	167.6	183.1	150.5	124.2	52.8	13.2	61	14	12
Côte d'Ivoire	5.70	150.5	244.0	239.4	226.9	171.0	82.1	26.2	2 471	20	15
Gambia	5.60	170.8	268.6	261.9	191.7	133.7	63.6	29.7	220	19	14
Ghana	5.70	123.1	239.4	253.1	223.4	168.7	102.6	29.6	3 261	16	18
Guinea	7.00	240.8	334.6	310.8	246.4	170.8	68.6	28.0	1 659	24	12
Guinea-Bissau	5.79	188.8	291.8	254.8	198.0	134.3	71.8	18.5	215	21	14
Liberia	6.80	229.8	281.5	289.7	253.0	186.3	88.4	31.3	576	24	14
Mali	7.10	198.8	306.7	285.4	276.9	191.7	115.0	45.4	2 539	20	15
Mauritania	5.40	132.6	237.7	257.5	206.5	140.9	69.2	35.7	425	18	15
Niger	7.40	219.0	340.4	331.5	254.6	190.9	102.1	41.4	2 218	22	14
Nigeria	6.45	149.6	278.6	286.4	237.4	169.0	99.3	69.7	23 582	17	17
Senegal	6.06	155.1	273.9	256.9	215.7	151.5	99.4	59.4	1 680	19	16
Sierra Leone	6.50	211.9	321.1	287.3	224.9	152.1	81.9	20.8	1 004	22	13
Togo	6.58	126.3	275.0	275.0	247.4	206.6	111.9	73.7	846	15	20
Asia	2.84	57.4	184.4	169.3	92.3	42.7	16.7	5.0	398 200	11	8
Eastern Asia	1.88	5.2	152.3	148.6	52.8	11.4	3.6	1.2	121 356	1	3
China	1.92	5.4	166.1	148.5	48.3	10.0	3.8	1.5	108 714	1	3
Democratic People's Republic of Korea	2.10	5.0	90.0	228.0	79.0	16.0	2.0	0.0	2 318	1	3
Hong Kong, China	1.32	7.4	45.1	91.9	82.9	31.7	4.8	0.3	356	2	14
Japan	1.48	3.9	43.6	130.5	93.7	22.5	2.4	0.0	6 185	1	9
Macau	1.60	6.7	60.5	117.4	87.4	42.6	4.8	0.6	35	1	14
Mongolia	3.56	31.3	198.6	210.0	143.1	86.2	33.5	9.3	339	6	11
Republic of Korea	1.65	4.0	70.6	178.9	62.4	12.2	1.7	0.3	3 411	1	3
South-central Asia	3.74	110.7	232.3	190.3	120.1	61.9	23.6	8.5	192 308	18	9
Afghanistan	6.90	153.2	329.8	336.7	274.6	182.2	86.9	16.6	4 276	15	13
Bangladesh	3.40	138.0	193.8	156.4	104.0	55.1	19.0	13.6	15 242	27	8
Bhutan	5.89	86.2	264.4	309.8	263.0	170.9	72.8	10.9	355	10	16
India	3.39	115.9	231.2	170.2	97.0	44.1	14.9	4.7	122 317	20	6
Iran (Islamic Republic of)	5.30	95.5	262.8	287.2	209.7	133.9	57.8	13.1	12 054	13	13
Kazakhstan	2.51	34.6	184.5	147.4	82.7	39.1	12.0	1.0	1 672	8	9
Kyrgyzstan	3.58	45.1	255.4	203.9	124.5	61.5	21.5	3.6	630	8	9
Maldives	6.80	70.7	253.0	307.4	266.6	236.6	144.2	81.6	49	8	24

TABLE A.30 *(continued)*

Major area, region or country	Total fertilit (per woman)	Age-specific fertility rate (per 1,000 women) for age group 15-19	20-24	25-29	30-34	35-39	40-44	45-49	Births (thousands)	Percentage of births to women: Under age 20	Aged 35 years or over
Nepal	5.43	92.2	276.7	262.6	205.1	146.5	74.9	27.1	3 985	12	16
Pakistan	5.51	92.7	250.0	283.8	228.6	143.3	68.4	35.7	25 178	11	15
Sri Lanka	2.20	33.9	106.5	129.4	100.3	52.4	13.6	4.0	1 630	9	13
Tajikistan	4.30	36.1	259.7	237.4	173.7	101.5	43.9	7.7	921	5	11
Turkmenistan	3.95	22.1	208.8	262.5	172.4	87.8	33.2	4.0	618	4	11
Uzbekistan	3.83	39.0	268.5	225.7	140.0	65.8	23.0	3.1	3 382	6	8
South-eastern Asia	3.15	51.1	160.3	173.2	125.5	79.0	36.8	5.0	60 962	10	13
Brunei Darussalam	3.00	28.2	126.0	174.0	146.4	88.2	33.6	3.6	36	5	17
Cambodia	4.90	11.7	170.3	236.9	226.1	190.9	142.9	0.0	1 788	1	26
East Timor	4.77	47.4	202.3	257.9	226.4	147.8	62.5	8.9	142	5	16
Indonesia	2.90	62.1	150.2	152.5	110.8	69.0	31.3	4.1	23 396	14	13
Lao People's Democratic Republic	6.69	50.8	267.6	314.4	275.6	243.5	132.4	53.5	1 026	6	23
Malaysia	3.62	29.0	160.4	231.5	168.6	97.9	33.1	3.5	2 734	5	14
Myanmar	3.60	34.9	148.8	208.2	159.4	110.9	49.8	8.1	6 221	6	16
Philippines	4.00	48.0	186.4	212.8	177.6	117.6	49.6	8.0	10 039	8	16
Singapore	1.79	7.9	54.3	133.6	111.4	43.2	6.8	0.0	288	2	13
Thailand	1.94	50.5	119.7	101.8	64.9	34.6	13.2	3.9	5 156	15	9
Viet Nam	3.40	44.9	205.4	205.4	119.7	66.0	36.7	2.0	10 136	8	10
Western Asia	4.06	66.1	198.9	211.3	155.2	107.0	53.6	19.2	23 573	11	15
Armenia	2.17	52.1	198.8	111.1	49.9	17.4	4.3	0.4	317	12	5
Azerbaijan	2.60	21.8	179.9	174.7	93.6	38.0	10.9	1.0	858	4	7
Bahrain	3.40	24.5	135.3	178.2	155.7	111.5	51.7	23.1	67	4	21
Cyprus	2.38	30.9	143.3	159.5	97.6	37.1	7.1	0.5	62	6	9
Gaza Strip	8.80	102.1	371.4	387.2	445.3	299.2	125.0	29.9	188	9	18
Georgia	2.10	50.8	169.7	115.1	55.9	22.7	5.5	0.4	433	12	7
Iraq	5.70	49.0	199.5	273.6	270.2	216.6	95.8	35.3	3 662	7	21
Israel	2.93	19.3	129.5	192.2	148.3	76.8	18.2	1.8	547	4	15
Jordan	5.57	48.5	221.3	308.7	261.0	179.9	74.9	19.8	935	7	14
Kuwait	3.10	40.9	158.1	189.1	130.8	77.5	19.2	4.3	231	8	13
Lebanon	3.09	32.1	133.0	193.6	139.0	79.3	33.2	6.9	374	6	13
Oman	7.20	122.4	339.8	368.6	313.9	188.6	86.4	20.2	436	13	13
Qatar	4.10	66.1	251.7	259.3	145.8	67.5	23.4	6.3	51	10	14
Saudi Arabia	6.37	123.6	201.3	248.4	234.4	244.6	184.7	36.9	3 006	17	25
Syrian Arab Republic	4.70	57.2	193.7	290.9	204.1	129.5	54.8	9.8	2 205	9	12
Turkey	2.70	59.4	180.9	151.7	87.5	44.8	13.5	2.2	6 747	14	8
United Arab Emirates	3.80	78.7	205.5	198.2	145.0	79.5	40.1	13.0	217	12	16
Yemen	7.60	101.8	279.7	305.5	285.8	253.8	171.8	121.6	3 236	11	23
Europe	1.57	27.6	97.0	99.4	61.8	23.1	4.6	0.3	41 665	8	9
Eastern Europe	1.62	41.7	135.2	85.5	41.5	16.4	3.7	0.2	17 821	13	7
Belarus	1.67	28.4	142.0	96.5	45.8	17.0	4.0	0.3	626	8	7
Bulgaria	1.53	60.3	141.1	69.5	25.4	8.3	1.5	0.0	454	21	3
Czech Republic	1.68	42.0	158.3	91.4	32.9	9.7	1.7	0.0	612	14	4

TABLE A.30 *(continued)*

Major area, region or country	Total fertilit (per woman)	Age-specific fertility rate (per 1,000 women) for age group 15-19	20-24	25-29	30-34	35-39	40-44	45-49	Births (thousands)	Percentage of births to women Under age 20	Aged 35 years or over
Hungary	1.69	34.5	133.5	107.1	44.6	15.2	3.0	0.0	588	12	6
Poland	1.89	28.4	151.2	114.2	55.2	23.1	6.0	0.0	2 540	8	9
Republic of Moldova	2.15	38.7	164.3	125.6	66.2	28.8	6.0	0.4	354	10	9
Romania	1.50	46.5	124.8	77.7	33.3	13.5	3.9	0.3	1 311	16	6
Russian Federation	1.53	44.7	127.3	75.9	38.9	15.6	3.4	0.3	8 017	14	7
Slovakia	1.85	42.6	166.1	103.6	41.4	14.1	2.2	0.0	365	13	5
Ukraine	1.64	42.6	137.1	86.3	42.6	16.1	3.3	0.0	2 954	13	6
Northern Europe	1.81	26.0	88.0	121.6	87.1	33.1	5.8	0.3	6 084	6	10
Denmark	1.75	8.8	65.1	137.6	99.8	33.6	5.3	0.0	332	2	11
Estonia	1.58	32.9	129.9	86.3	44.6	18.6	3.8	0.0	83	10	8
Finland	1.83	11.0	72.5	135.4	100.7	38.4	7.7	0.4	327	3	14
Iceland	2.19	25.0	102.5	139.7	107.7	52.6	10.5	0.0	23	6	13
Ireland	2.01	15.3	58.3	135.1	117.8	60.7	14.1	0.8	248	5	18
Latvia	1.64	35.1	133.2	86.9	47.6	20.0	4.9	0.3	150	10	8
Lithuania	1.78	25.6	144.5	105.7	51.6	22.4	5.7	0.4	246	7	8
Norway	1.88	15.8	85.4	136.9	97.8	35.0	5.3	0.0	297	4	10
Sweden	2.01	11.7	87.2	144.3	108.5	42.6	7.2	0.4	590	3	12
United Kingdom	1.78	32.0	86.5	116.8	84.4	31.0	5.0	0.4	3 763	8	10
Southern Europe	1.40	15.2	66.4	97.2	69.0	26.5	5.3	0.4	7 670	5	10
Albania	2.85	14.3	153.9	197.8	125.4	58.1	17.7	2.9	397	3	10
Bosnia and Herzegovina	1.50	31.2	111.0	90.9	45.6	17.1	3.9	0.3	249	9	7
Croatia	1.65	31.7	131.7	103.0	45.5	15.2	2.6	0.3	254	9	6
Greece	1.38	17.9	77.0	95.5	59.1	22.1	4.1	0.3	517	6	9
Italy	1.24	8.2	49.1	87.8	69.4	28.3	5.0	0.2	2 721	3	12
Malta	2.08	12.9	86.9	158.1	106.5	42.0	9.2	0.4	27	3	14
Portugal	1.52	22.2	77.2	107.0	67.5	24.0	5.5	0.6	562	8	9
Slovenia	1.36	27.7	113.7	81.6	33.7	12.2	2.7	0.3	95	10	6
Spain	1.27	10.4	42.7	92.5	75.2	27.4	5.6	0.3	1 960	4	11
The former Yugoslav Republic of Macedonia	2.10	43.7	163.0	131.9	57.1	19.3	4.6	0.4	173	10	6
Yugoslavia	1.93	40.5	139.7	118.1	57.9	22.8	6.2	0.8	691	11	8
Western Europe	1.49	10.9	64.6	111.0	78.3	28.2	5.2	0.3	10 089	3	11
Austria	1.47	22.1	85.0	102.6	58.8	21.8	3.5	0.3	452	6	8
Belgium	1.62	9.4	80.4	140.0	70.0	20.4	3.6	0.3	600	2	8
France	1.70	8.5	71.4	131.9	87.0	33.7	7.1	0.3	3 623	2	12
Germany	1.30	13.3	60.3	92.3	66.3	23.4	4.2	0.3	3 984	4	10
Luxembourg	1.66	12.6	72.4	123.8	89.3	29.5	4.0	0.3	25	3	10
Netherlands	1.59	7.3	43.6	116.7	110.7	35.0	4.5	0.3	976	2	12
Switzerland	1.53	4.6	47.7	114.8	98.2	34.6	5.8	0.3	422	1	13
Latin America and the Caribbean	2.93	78.1	163.9	151.0	104.7	61.4	23.0	4.6	56 867	16	11
Caribbean	2.70	71.9	145.1	138.1	97.1	56.9	23.2	7.0	3 945	15	11
Bahamas	1.95	51.6	102.0	100.4	81.3	43.0	10.6	2.0	25	14	11

TABLE A.30 *(continued)*

Major area, region or country	Total fertilit (per woman)	Age-specific fertility rate (per 1,000 women) for age group 15-19	20-24	25-29	30-34	35-39	40-44	45-49	Births (thousands)	Percentage of births to women Under age 20	Aged 35 years or over
Barbados	1.73	50.5	96.9	92.7	67.8	30.1	6.9	1.0	20	14	9
Cuba	1.60	67.2	101.2	85.1	47.2	16.9	2.6	0.4	806	19	4
Dominican Republic	3.09	91.2	180.4	161.2	103.5	57.3	19.5	5.8	1 008	18	9
Guadeloupe	2.14	32.5	98.4	134.4	94.6	53.1	14.1	0.9	39	8	13
Haiti	4.79	53.9	192.1	232.7	204.3	152.7	89.3	33.0	1 200	8	20
Jamaica	2.61	95.0	143.0	121.6	86.7	52.7	19.8	3.1	290	20	9
Martinique	2.05	25.8	95.1	125.1	99.6	50.8	12.7	0.8	33	6	13
Netherlands Antilles	2.20	35.2	107.4	140.8	95.9	47.1	12.3	1.3	17	8	15
Puerto Rico	2.18	72.8	137.3	121.2	70.6	27.9	5.7	0.4	322	18	7
Trinidad and Tobago	2.29	59.6	128.5	123.9	87.2	45.9	13.8	0.0	113	15	10
Central America	3.41	86.9	184.9	171.6	125.4	79.0	28.8	5.8	16 939	17	11
Belize	4.18	117.0	241.6	188.9	155.5	86.1	43.5	3.3	34	20	8
Costa Rica	3.14	93.1	173.4	155.1	113.6	67.8	22.9	2.4	425	17	11
El Salvador	3.50	105.0	191.4	166.7	116.6	76.7	34.4	9.2	800	22	10
Guatemala	5.36	123.0	262.2	261.7	212.0	141.7	60.9	10.5	1 916	17	13
Honduras	4.92	126.5	252.2	219.1	178.9	124.5	67.7	14.3	976	18	13
Mexico	3.12	76.6	171.3	161.1	115.2	71.5	23.6	4.7	11 785	16	10
Nicaragua	4.41	149.3	254.3	189.7	143.4	93.9	39.5	11.9	689	24	9
Panama	2.88	90.7	166.9	147.3	98.3	51.2	18.2	4.3	314	18	9
South America	2.78	74.8	157.2	144.8	98.5	56.0	21.1	4.0	35 983	16	11
Argentina	2.83	69.7	146.9	154.0	112.6	60.8	19.1	2.5	3 502	15	13
Bolivia	4.80	82.4	227.7	236.7	189.3	132.5	69.8	21.6	1 247	12	16
Brazil	2.44	73.4	146.3	129.3	81.2	41.5	14.2	2.5	16 591	17	9
Chile	2.54	55.7	149.1	148.0	95.3	46.5	12.0	1.0	1 489	11	9
Colombia	2.92	80.0	170.0	148.0	100.0	59.0	23.0	4.0	4 450	15	10
Ecuador	3.52	79.4	175.5	169.0	132.4	90.6	44.8	11.5	1 534	15	14
Guyana	2.55	65.9	163.9	146.4	78.5	41.6	13.3	0.4	102	14	7
Paraguay	4.55	86.7	211.9	208.8	186.6	135.5	66.6	13.9	771	13	17
Peru	3.43	62.8	164.9	169.9	136.1	97.5	45.4	9.3	3 109	12	15
Suriname	2.68	62.3	162.4	160.7	88.2	47.3	14.9	0.0	52	13	6
Uruguay	2.33	60.4	131.3	127.1	86.2	45.9	14.0	1.1	268	15	11
Venezuela	3.29	101.4	181.1	161.6	115.7	67.9	25.5	5.7	2 831	19	11
Northern America	2.02	59.1	110.6	117.3	79.8	31.5	5.2	0.4	22 268	13	10
Canada	1.74	26.1	76.6	120.8	89.1	31.0	4.5	0.0	2 023	6	10
United States of America	2.05	62.8	114.4	116.9	78.8	31.6	5.3	0.4	20 237	13	10
Oceania	2.51	28.4	107.0	156.1	124.2	58.3	21.0	7.9	2 619	6	16
Australia-New Zealand	1.93	24.0	78.4	133.9	105.0	38.5	6.1	0.4	1 589	6	11
Australia	1.89	22.0	75.0	132.6	104.5	38.3	6.1	0.4	1 297	5	12
New Zealand	2.12	33.5	95.0	141.2	107.7	39.9	6.4	0.4	292	8	10
Melanesia	4.68	33.8	177.7	221.3	198.8	151.4	101.1	51.7	883	5	23
Fiji	2.98	45.7	179.0	177.1	109.2	59.7	21.0	4.3	90	10	11

TABLE A.30 *(continued)*

Major area, region or country	Total fertilit (per woman)	Age-specific fertility rate (per 1,000 women) for age group 15-19	20-24	25-29	30-34	35-39	40-44	45-49	Births (thousands)	Percentage of births to women: Under age 20	Aged 35 years or over
New Caledonia	2.74	53.2	158.9	150.2	103.6	56.4	21.9	3.8	20	12	11
Papua New Guinea	5.05	23.2	169.7	227.3	222.2	176.8	124.2	66.7	680	4	27
Solomon Islands	5.39	98.8	247.4	267.4	217.3	152.0	71.1	23.8	65	14	14
Vanuatu	4.68	74.9	224.6	237.7	187.2	132.0	58.0	21.5	28	10	15
Micronesia	4.40	65.2	219.9	241.7	189.7	114.2	42.7	5.8	75	10	12
Guam	3.35	91.1	215.1	177.6	113.9	57.0	14.1	1.3	19	13	9
Polynesia	3.53	49.8	167.4	188.2	145.1	97.3	42.9	14.3	72	10	15
French Polynesia	3.05	73.2	182.4	164.7	112.9	60.4	14.6	1.8	27	14	9
Samoa	4.20	21.8	139.4	213.4	189.8	154.6	87.4	33.6	22	5	22

Source: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.XIII.5).
[a]Comprising all regions of Europe and Northern America, Australia-New Zealand and Japan.
[b]Comprising all regions of Africa, Asia (excluding Japan) and Latin America and the Caribbean, and regions of Melanesia, Micronesia and Polynesia.

TABLE A.31. TRENDS IN PERCENTAGE OF MARRIED WOMEN[a] USING CONTRACEPTION, MAJOR AREAS, REGIONS AND COUNTRIES
(Most recent survey data available, 1970 or later)

	Level of current contraceptive use				Trends		
			Percentage using			Annual increase in percentage using	
Major area, region or country	*Year*	*Age range*	*Any method*	*Modern[b] method*	*Time period*	*Any method*	*Modern[b] method*
World total	1992[c]	15-49	58	52			
More developed regions			71	57			
Less developed regions			56	51			
Least developed countries			21	16			
Africa			20	16			
Eastern Africa							
Burundi	1987	15-49	9	1			
Comoros	1996	15-49	21	11			
Eritrea	1995	15-49	5[d]	4			
Ethiopia	1990	15-49[e,f]	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
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 Republic of Tanzania	1996	15-49	18	13	1991-1996	1.7	1.4
Zambia	1996	15-49	25[d,h]	14[h]	1992-1996	2.1	1.2
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 Republic	1994/95	15-49	15	3			
Democratic Republic of the Congo	1991	12-49	8	2			
Northern Africa							
Algeria	1995	15-49[f]	52[d,i]	49[i]	1986-1995	1.9	2.0
Egypt	1995	15-49	47[d]	46	1984-1995	1.6	1.5
Libyan Arab Jamahiriya	1995	15-49	40[d]	26			
Morocco	1995	15-49	50	42	1983-1995	2.2	1.9
Sudan (north)	1992/93	15-49	8[d]	7	1978-1993	0.3	0.2
Tunisia	1994	15-49	60[h]	51[h]	1983-1994	1.8	1.6
Southern Africa							
Botswana	1988	15-49	33	32	1984-1988	1.2	3.0
Lesotho	1991	15-49[j]	23[h]	19[h]	1977-1991	1.3[k]	1.2[k]
Namibia	1992	15-49	29	26			
South Africa	1988	15-49	50	48	1975-1988	1.0	1.1
Swaziland	1988	15-49[l]	20	17			
Western Africa							
Benin	1996	15-49	16[h]	3[h]	1981-1996	0.5	0.2
Burkina Faso	1993	15-49	8[m]	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[d]	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[h]	8[h]	1986-1997	0.1	0.5
Togo	1988	15-49	12[m]	3			

TABLE A.31 *(continued)*

Major area, region or country	Level of current contraceptive use: Year	Age range	Percentage using: Any method	Percentage using: Modern method	Trends: Time period	Annual increase in percentage using: Any method	Annual increase in percentage using: Modern[b] method
Asia			61	56			
Eastern Asia							
China	1992	15-49	83	80	1982-1992	1.3	1.2
Democratic People's Republic of Korea		1990/92	15-49[n]	62	53		
Hong Kong, China	1992	15-49	86	80	1982-1992	1.4	1.6
Japan	1994	15-49	59	53[o]	1984-1994	0.1	0.2
Mongolia	1994	15-49[j]	61	25			
Republic of Korea	1991	15-44	79	70	1979-1991	2.0	2.2
South-central Asia							
Afghanistan	1972/73	15-44[f]	2	2			
Bangladesh	1996/97	10-49	49	42	1983-1997	2.1	2.0
India	1992/93	13-49	41	36	1980-1993	0.5	0.7
Iran (Islamic Republic of)	1992	15-44	65	45	1989-1992	5.8[k]	6.3[k]
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	1979-1995	1.0	0.6
Sri Lanka	1993	15-49[p]	66	44	1982-1993	0.7	1.0
Uzbekistan	1996	15-49	56	51			
South-eastern Asia							
Indonesia	1994	15-49	55	52	1987-1994	1.0	1.2
Lao People's Democratic Republic	1993	15-49[q]	19	15			
Malaysia (Peninsular)	1988	15-49	48	31	1974-1988	1.1	0.6
Myanmar	1992	15-49	17[h]	14[h]			
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	1989	15-49[r]	53[d]	30			
Iraq	1989	15-49[r]	14[d]	10	1974-1989	-0.1	-0.2
Jordan[s]	1990	15-49	35	27	1976-1990	0.7	0.7
Lebanon	1971	15-49	53	23			
Kuwait	1987	15-49[r]	35	32			
Oman	1988/89	15-49[r]	9	8			
Qatar	1987	15-49	32	29			
Syrian Arab Republic	1993	15-49	36[d]	28	1978-1993	1.1	0.9
Turkey	1993	15-49	63	35	1983-1993	1.2	1.2
Yemen	1991/92	15-49	7[d]	6			
Europe			73	52			
Eastern Europe							
Belarus	1995	18-34	50	42			
Bulgaria	1976	15-44[t]	76	8			
Czech Republic	1993	15-44	69	45			
Hungary	1993	15-44	73	64	1977-1993	0.0[k]	0.8[k]
Poland	1977	< 45	75[i]	26[i]	1972-1977	3.0	2.6
Romania	1993	15-49	57	15	1978-1993	0.0	0.6
Slovakia	1991	15-44[u]	74	41			
Northern Europe							
Denmark	1988	15-44[t,u]	78	72	1975-1988	1.2[k]	0.9[k]
Estonia	1994	20-49[u]	70	56			
Finland	1977	18-44[t]	80	78	1971-1977	0.6	4.4
Latvia	1995	18-49	47[h]	38[h]			
Lithuania	1994/95	18-49	59[h]	40[h]			
Norway	1988	[v]	76	72[o]	1977-1988	0.4[k]	0.6[k]

TABLE A.31 *(continued)*

Major area, region or country	Level of current contraceptive use: Year	Age range	Percentage using: Any method	Modern method	Trends: Time period	Annual increase in percentage using: Any method	Modern[b] method
Sweden	1981	20-44[u]	78	71			
United Kingdom[w]	1993	16-49	82	81	1986-1993	0.1	0.1
Southern Europe							
Italy	1979	18-44[t]	78[x]	32[x]			
Portugal	1979/80	15-49	66	33			
Spain	1985	18-49	59	38	1977-1985	1.1[k]	2.4[k]
Yugoslavia, SFR[y]	1976	<45[t]	55[i]	12[i]	1970-1976	-0.7	0.3
Western Europe							
Austria	1981/82	[z]	71	56			
Belgium[aa]	1991	20-40	79	75	1982-1991	-0.1	1.2
France	1994	20-44	77	70	1978-1994	-0.1	1.4
Germany	1992	20-39	75	72			
Netherlands	1993	18-39	78	76	1982-1993	0.1	0.2
Switzerland	1980	[bb]	71	65			
Latin America and the Caribbean			64	56			
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	1.4
Grenada	1990	15-44[g]	54	52	1985-1990	4.7	5.0
Guadeloupe	1976	15-44[g]	44	31			
Haiti	1994/95	15-49[g]	18	13	1983-1994	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[u]	53	52			
Puerto Rico	1982	15-49[f]	64	58	1968-1982	0.3	0.5
Saint Kitts and Nevis	1984	15-44[u]	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[k]	0.4[k]
Guatemala	1995	15-44	31	27	1983-1995	0.5[k]	0.5[k]
Honduras	1991/92	15-44	47	35	1981-1992	1.8	1.0
Mexico	1987	15-49	53	45	1976-1987	2.1	2.0
Nicaragua	1992	15-49	49	45	1981-1992	1.9[k]	1.9[k]
Panama	1984	20-44	58[cc]	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	15-44	57	46	1982-1994	1.4	1.1
Guyana	1975	15-49[g]	31	28			
Paraguay	1995/96	15-49	56[h]	41[h]	1987-1996	6.0	1.5
Peru	1996	15-49	64[h]	41[h]	1981-1996	1.6	1.6
Venezuela	1977	15-44	49	38			
Northern America			71	67			
Canada	1984	18-49	73	70			
United States of America	1990	15-44	71	67	1982-1990	0.3	0.6

TABLE A.31 *(continued)*

Major area, region or country	Level of current contraceptive use: Year	Age range	Percentage using: Any method	Modern[d] method	Trends: Time period	Annual increase in percentage using: Any method	Modern[b] method
Oceania			66	62			
Australia	1986	20-49	76	72			
Fiji	1974	15-49	41	35			
New Zealand	1995	20-49	75	72	1976-1995	0.3[k]	0.5[k]

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

NOTE : The present table shows the most recent data available as of 1 October 1997.

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. Further information about the methodology is given in *Levels and Trends of Contraceptive Use as Assessed in 1994* (United Nations publication, Sales No. E.96.XIII.13).

[a] Including consensual unions, where possible.
[b] Modern or clinic and supply methods including male and female sterilization, intrauterine devices (IUDS), the pill, injectables, hormonal implants, condoms and female barrier methods.
[c] Population-weighted average date of recent surveys.
[d] Adjusted from source to exclude breastfeeding.
[e] Excluding Eritrea, Tigrai, Asseb, Ogaden, parts of Gondar and Wello, and nomadic population.
[f] Ever-married women.
[g] Including visiting unions.
[h] Preliminary or provisional.
[i] Excluding sterilization.
[j] For all women of ages specified.
[k] Trend may be affected by differences in the base population or geographical coverage at the two dates.
[l] Including never-married women who have a child.
[m] Excluding prolonged abstinence: 17 per cent in Burkina Faso; 22 per cent in Togo.
[n] Not clear from source whether sample is nationally representative.
[o] Some women reported more than one method; figure shown assumes that modern methods were not used in combination with other modern methods.
[p] Excluding areas containing roughly 15 per cent of the population.
[q] Not a nationally representative sample; national prevalence level is probably lower than indicated.
[r] Households of nationals of the country.
[s] Excluding West Bank.
[t] Women in first marriage.
[u] All sexually active women.
[v] Women currently married or cohabiting who were born in 1945, 1950, 1960, 1965 or 1968.
[w] Data pertaining to Great Britain.
[x] Use since last pregnancy (since marriage, if no pregnancy).
[y] Former Socialist Federal Republic of Yugoslavia.
[z] Marriage cohorts of 1974 and 1977.
[aa] Flemish population.
[bb] Sample of husbands and wives married between 1970 and 1979.
[cc] Excluding douche, abstinence and folk methods.
[d] Modern or clinic and supply methods including male and female sterilization, intrauterine devices (IUDS), the pill, injectables, hormonal implants, condoms and female barrier methods.

TABLE A.32. TRENDS IN LIFE EXPECTANCY AT BIRTH, MAJOR AREAS, REGIONS AND COUNTRIES, 1970-1995

Major area, region or country	Life expectancy at birth (years) 1970-1975 Male	Female	Both sexes	1990-1995 Male	Female	Both sexes	Change (in years) 1970-1975 to 1990-1995 Male	Female	Both sexes
World total	56.4	59.4	57.9	62.2	66.5	64.3	5.7	7.0	6.3
More developed regions[a]	67.6	74.7	71.2	70.4	78.0	74.2	2.8	3.4	3.0
Less developed regions[b]	53.9	55.4	54.7	60.6	63.7	62.1	6.7	8.2	7.4
Least developed countries	42.8	44.5	43.6	48.7	50.8	49.7	5.9	6.4	6.1
Africa	44.5	47.6	46.0	50.4	53.3	51.8	5.9	5.7	5.8
Eastern Africa	43.2	46.4	44.8	45.4	48.0	46.7	2.2	1.6	1.9
Burundi	42.4	45.6	44.0	43.0	46.2	44.6	0.5	0.5	0.6
Comoros	47.0	48.0	47.5	55.0	56.0	55.5	8.0	8.0	8.0
Djibouti	39.5	42.6	41.0	46.7	50.0	48.3	7.3	7.4	7.3
Eritrea	42.8	45.9	44.3	48.0	51.2	49.6	5.3	5.2	5.3
Ethiopia	39.5	42.6	41.0	45.9	49.1	47.5	6.5	6.5	6.5
Kenya	49.0	53.0	51.0	52.7	55.4	54.1	3.7	2.4	3.1
Madagascar	45.0	48.0	46.5	55.0	58.0	56.5	10.0	10.0	10.0
Malawi	40.3	41.7	41.0	41.4	42.4	42.0	1.1	0.8	1.0
Mauritius	60.7	65.3	62.9	66.9	73.8	70.2	6.2	8.5	7.3
Mozambique	40.9	44.1	42.5	44.4	47.5	46.0	3.5	3.4	3.5
Réunion	60.4	68.1	64.2	69.4	78.8	74.0	9.0	10.7	9.8
Rwanda	43.0	46.2	44.6	22.1	23.1	22.6	-20.9	-23.1	-22.0
Somalia	39.4	42.6	41.0	45.4	48.6	47.0	6.0	6.0	6.0
Uganda	44.9	48.1	46.5	40.0	42.0	41.0	-4.9	-6.1	-5.5
United Republic of Tanzania	44.9	48.2	46.5	49.0	51.9	50.4	4.1	3.7	3.9
Zambia	45.7	49.0	47.3	43.3	45.0	44.2	-2.4	-4.0	-3.1
Zimbabwe	49.8	53.3	51.5	49.6	51.9	50.7	-0.2	-1.3	-0.8
Middle Africa	42.3	45.6	43.9	49.3	52.7	51.0	7.1	7.1	7.1
Angola	36.5	39.6	38.0	44.9	48.1	46.5	8.4	8.5	8.5
Cameroon	44.3	47.3	45.8	53.3	56.2	54.7	9.0	8.9	8.9
Central African Republic	40.5	45.6	43.0	45.8	50.9	48.3	5.4	5.3	5.3
Chad	37.5	40.6	39.0	45.1	48.3	46.7	7.6	7.7	7.7
Congo	44.1	49.3	46.7	48.9	54.1	51.5	4.8	4.8	4.8
Democratic Republic of the Congo	44.4	47.6	46.0	50.3	53.7	52.0	5.9	6.1	6.0
Equatorial Guinea	39.0	42.1	40.5	46.4	49.6	48.0	7.5	7.5	7.5
Gabon	43.4	46.6	45.0	51.9	55.2	53.5	8.5	8.6	8.5
Northern Africa	50.0	52.6	51.3	60.8	63.4	62.1	10.8	10.8	10.8
Algeria	53.5	55.5	54.5	66.0	68.3	67.1	12.5	12.8	12.7
Egypt	50.8	53.4	52.1	62.4	64.8	63.6	11.6	11.4	11.5
Libyan Arab Jamahiriya	51.4	54.5	52.9	61.6	65.0	63.1	10.2	10.5	10.2
Morocco	51.4	54.5	52.9	62.8	66.2	64.5	11.4	11.7	11.6
Sudan	42.3	45.1	43.7	49.6	52.4	51.0	7.3	7.3	7.3
Tunisia	55.1	56.1	55.6	66.9	68.7	67.8	11.8	12.6	12.2
Southern Africa	50.6	56.3	53.4	59.3	64.9	62.1	8.7	8.6	8.7
Botswana	51.5	55.0	53.2	52.5	55.8	54.3	1.0	0.8	1.1
Lesotho	47.5	51.5	49.5	56.4	59.0	57.6	8.9	7.5	8.1
Namibia	47.5	50.0	48.8	54.6	57.2	55.9	7.1	7.2	7.2
South Africa	51.0	57.0	53.9	60.0	66.0	62.9	9.0	9.0	9.0
Swaziland	45.1	49.6	47.3	55.2	59.8	57.5	10.1	10.2	10.2
Western Africa	41.4	44.4	42.9	48.0	51.1	49.5	6.6	6.7	6.6
Benin	42.3	45.8	44.0	51.3	56.2	53.7	9.0	10.4	9.7
Burkina Faso	39.7	42.2	40.9	45.4	47.6	46.5	5.7	5.4	5.5
Cape Verde	56.0	59.0	57.5	63.5	65.5	64.7	7.5	6.5	7.2
Côte d'Ivoire	43.9	47.1	45.4	50.8	53.6	52.1	6.9	6.5	6.7
Gambia	35.5	38.5	37.0	43.4	46.6	45.0	7.9	8.1	8.0
Ghana	48.3	51.7	50.0	54.2	57.8	56.0	5.9	6.1	6.0
Guinea	36.8	37.8	37.3	44.0	45.0	44.5	7.2	7.2	7.2
Guinea-Bissau	35.0	38.0	36.5	41.3	44.4	42.8	6.3	6.4	6.3
Liberia	46.0	49.0	47.5	38.0	41.0	39.4	-8.0	-8.0	-8.1

TABLE A.32 *(continued)*

Major area, region or country	Life expectancy at birth (years) 1970-1975 Male	Female	Both sexes	1990-1995 Male	Female	Both sexes	Change (in years) 1970-1975 to 1990-1995 Male	Female	Both sexes
Mali	37.0	40.1	38.5	44.4	47.6	46.0	7.4	7.6	7.5
Mauritania	41.9	45.1	43.5	49.9	53.1	51.5	8.0	8.0	8.0
Niger	37.5	40.6	39.0	44.9	48.1	46.5	7.4	7.6	7.5
Nigeria	41.9	45.1	43.5	48.8	52.0	50.4	6.9	6.9	6.9
Senegal	39.3	41.3	40.3	48.3	50.3	49.3	9.0	9.0	9.0
Sierra Leone	33.5	36.5	35.0	32.9	35.9	34.3	-0.6	-0.6	-0.7
Togo	43.9	47.1	45.5	49.5	52.6	51.0	5.5	5.5	5.5
Asia	55.8	56.8	56.3	63.2	66.0	64.5	7.3	9.2	8.2
Eastern Asia	63.2	65.2	64.2	67.6	71.9	69.7	4.4	6.8	5.5
China	62.5	63.9	63.2	66.7	70.5	68.5	4.2	6.6	5.3
Democratic People's Republic of Korea	59.2	64.0	61.8	67.7	73.9	71.0	8.5	9.9	9.2
Hong Kong, China	68.5	75.6	72.0	75.6	81.3	78.4	7.1	5.7	6.4
Japan	70.6	76.2	73.3	76.4	82.4	79.5	5.8	6.2	6.2
Mongolia	52.5	55.0	53.8	62.3	65.0	63.7	9.8	10.0	9.9
Republic of Korea	59.3	66.1	62.6	67.3	74.8	71.0	8.0	8.7	8.4
South-central Asia	50.8	49.6	50.2	59.9	60.8	60.4	9.2	11.2	10.2
Afghanistan	38.0	38.0	38.0	43.0	44.0	43.5	5.0	6.0	5.5
Bangladesh	45.6	44.1	44.9	55.6	55.6	55.5	10.0	11.5	10.7
Bhutan	40.0	41.5	40.7	49.1	52.4	50.7	9.1	10.9	10.0
India	51.2	49.3	50.3	60.3	60.6	60.5	9.1	11.3	10.2
Iran (Islamic Republic of)	56.2	55.5	55.9	67.0	68.0	67.5	10.8	12.5	11.6
Kazakhstan	59.2	69.3	64.4	62.8	72.5	67.7	3.7	3.1	3.3
Kyrgyzstan	58.8	67.3	63.1	63.4	71.9	67.7	4.6	4.7	4.6
Maldives	52.7	50.1	51.4	63.4	60.8	62.1	10.7	10.7	10.7
Nepal	44.0	42.5	43.3	55.1	54.1	54.6	11.1	11.6	11.3
Pakistan	50.6	50.5	50.6	60.6	62.6	61.5	10.0	12.1	10.9
Sri Lanka	64.0	66.0	65.0	69.7	74.2	71.9	5.7	8.2	6.9
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	61.2	68.0	64.6	4.0	3.9	3.9
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	61.7	65.6	63.7	11.5	12.1	11.8
Brunei Darussalam	66.9	69.9	68.3	72.4	77.1	74.5	5.5	7.2	6.2
Cambodia	39.0	41.7	40.3	50.1	52.9	51.6	11.1	11.2	11.3
East Timor	39.2	40.7	40.0	44.2	45.9	45.0	4.9	5.2	5.0
Indonesia	48.0	50.5	49.3	61.0	64.5	62.7	13.0	14.0	13.5
Lao People's Democratic Republic	39.1	41.8	40.4	49.5	52.5	51.0	10.4	10.7	10.6
Malaysia	61.4	64.7	63.0	68.7	73.0	70.8	7.3	8.3	7.8
Myanmar	48.3	51.4	49.8	56.0	59.3	57.6	7.7	7.9	7.8
Philippines	56.4	59.4	57.8	64.5	68.2	66.3	8.1	8.8	8.5
Singapore	67.3	71.8	69.5	74.0	78.5	76.3	6.7	6.7	6.7
Thailand	57.7	61.6	59.6	66.4	71.7	69.0	8.6	10.2	9.4
Viet Nam	47.7	53.1	50.3	62.9	67.3	65.2	15.2	14.2	14.9
Western Asia	56.1	59.9	57.9	64.4	68.4	66.3	8.3	8.5	8.4
Armenia	69.3	75.3	72.5	67.2	74.0	70.7	-2.1	-1.3	-1.8
Azerbaijan	64.9	72.5	69.0	66.5	74.5	70.6	1.6	2.0	1.6
Bahrain	61.7	65.4	63.5	69.8	74.1	71.6	8.1	8.7	8.1
Cyprus	70.0	72.9	71.4	74.7	79.0	76.8	4.7	6.1	5.4
Georgia	65.0	72.9	69.2	68.5	76.7	72.8	3.5	3.8	3.6
Iraq	56.1	57.9	57.0	57.6	60.0	58.8	1.5	2.1	1.8
Israel	70.1	73.3	71.6	75.3	78.7	77.0	5.2	5.5	5.4
Jordan	54.9	58.3	56.6	66.2	69.8	67.9	11.3	11.5	11.4
Kuwait	65.3	69.3	67.3	73.3	77.2	74.9	8.0	7.9	7.7
Lebanon	63.1	67.0	65.0	66.6	70.5	68.5	3.5	3.5	3.5
Oman	47.8	50.2	49.0	67.7	71.8	69.5	19.9	21.6	20.5
Qatar	60.7	64.4	62.5	68.8	74.2	70.5	8.1	9.8	8.0
Saudi Arabia	52.4	55.5	53.9	68.4	71.4	69.7	16.0	15.9	15.8

TABLE A.32 *(continued)*

Major area, region or country	Life expectancy at birth (years) 1970-1975 Male	Female	Both sexes	1990-1995 Male	Female	Both sexes	Change (in years) 1970-1975 to 1990-1995 Male	Female	Both sexes
Syrian Arab Republic	55.4	58.7	57.0	65.2	69.2	67.1	9.8	10.5	10.1
Turkey	55.9	60.0	57.9	65.0	69.6	67.3	9.1	9.6	9.4
United Arab Emirates	60.7	64.4	62.5	72.9	75.3	73.8	12.2	10.9	11.3
Yemen	41.9	42.4	42.1	54.9	55.9	55.5	13.0	13.5	13.4
Europe	67.1	74.2	70.8	68.5	76.9	72.7	1.3	2.6	1.9
Eastern Europe	64.8	73.4	69.4	63.0	73.6	68.2	-1.8	0.2	-1.2
Belarus	66.6	75.5	71.5	64.4	74.8	69.7	-2.2	-0.7	-1.8
Bulgaria	68.7	73.9	71.2	67.8	74.9	71.2	-0.9	1.0	0.0
Czech Republic	66.7	73.5	70.0	68.8	75.2	72.0	2.2	1.7	2.0
Hungary	66.5	72.3	69.3	64.5	73.8	69.0	-2.0	1.4	-0.3
Poland	67.0	74.1	70.4	66.7	75.7	71.1	-0.3	1.6	0.7
Republic of Moldova	61.6	68.5	64.8	63.5	71.5	67.6	1.9	3.0	2.8
Romania	66.8	71.3	69.0	66.0	73.2	69.5	-0.8	1.9	0.5
Russian Federation	63.1	73.5	68.2	60.4	72.7	66.5	-2.7	-0.8	-1.7
Slovakia	66.8	73.5	70.0	66.5	75.4	70.8	-0.2	1.9	0.8
Ukraine	65.3	74.0	70.1	63.6	74.0	68.8	-1.7	-0.0	-1.3
Northern Europe	69.2	75.5	72.4	72.8	78.8	75.8	3.6	3.3	3.4
Denmark	70.9	76.4	73.6	72.5	77.8	75.1	1.6	1.4	1.6
Estonia	65.7	74.6	70.5	63.9	75.0	69.5	-1.8	0.4	-1.0
Finland	66.6	75.0	70.7	72.0	79.6	75.9	5.4	4.6	5.2
Iceland	71.4	77.4	74.3	76.9	80.7	78.8	5.5	3.3	4.5
Ireland	68.9	73.8	71.3	73.2	78.6	75.8	4.3	4.8	4.5
Latvia	65.3	74.5	70.1	62.5	74.3	68.4	-2.8	-0.2	-1.7
Lithuania	67.0	75.4	71.3	64.9	76.0	70.4	-2.1	0.6	-0.9
Norway	71.4	77.6	74.4	74.2	80.3	77.2	2.9	2.7	2.8
Sweden	72.1	77.5	74.7	75.4	80.8	78.1	3.3	3.3	3.4
United Kingdom	69.0	75.2	72.0	73.7	79.0	76.3	4.7	3.8	4.3
Southern Europe	68.7	74.2	71.5	72.7	79.3	76.0	4.0	5.2	4.6
Albania	66.0	69.5	67.7	68.0	74.0	70.9	2.0	4.5	3.2
Bosnia and Herzegovina	65.2	69.5	67.4	69.5	75.1	72.4	4.3	5.6	4.9
Croatia	66.2	72.9	69.6	67.1	75.7	71.4	0.9	2.8	1.8
Greece	70.6	74.2	72.3	75.0	80.1	77.5	4.4	5.9	5.2
Italy	69.2	75.2	72.1	74.2	80.6	77.5	5.0	5.4	5.4
Malta	68.5	72.8	70.6	73.8	78.3	76.1	5.3	5.6	5.5
Portugal	64.9	71.3	68.0	70.8	78.1	74.4	5.9	6.8	6.4
Slovenia	66.0	73.5	69.8	68.2	77.3	72.8	2.2	3.8	2.9
Spain	70.2	75.7	72.8	73.7	81.0	77.3	3.5	5.3	4.5
The former Yugoslav Republic of Macedonia	66.1	68.9	67.5	69.3	73.6	71.4	3.2	4.7	4.0
Yugoslavia	66.8	70.6	68.8	69.0	74.4	71.7	2.2	3.8	2.9
Western Europe	68.4	75.0	71.8	73.2	80.2	76.7	4.7	5.2	5.0
Austria	67.0	74.3	70.6	72.8	79.3	76.2	5.8	5.0	5.6
Belgium	68.2	74.7	71.4	73.0	79.8	76.4	4.8	5.1	5.0
France	68.6	76.3	72.3	73.8	82.4	78.0	5.2	6.1	5.7
Germany	67.9	73.8	71.0	72.6	79.1	76.0	4.7	5.3	5.0
Luxembourg	67.2	74.4	70.7	72.1	79.0	75.6	4.9	4.6	4.9
Netherlands	71.1	77.0	74.0	74.2	80.2	77.2	3.1	3.2	3.2
Switzerland	70.8	77.0	73.8	74.5	81.3	77.9	3.7	4.3	4.1
Latin America and the Caribbean	58.7	63.5	61.1	65.3	71.8	68.5	6.5	8.3	7.4
Caribbean	61.4	65.0	63.1	66.4	70.8	68.5	5.0	5.8	5.4
Bahamas	63.2	69.9	66.6	69.3	76.0	72.7	6.2	6.1	6.1
Barbados	66.9	72.0	69.4	72.9	77.9	75.6	6.0	5.9	6.1
Cuba	69.4	72.7	70.9	73.5	77.3	75.3	4.1	4.5	4.4
Dominican Republic	58.1	61.8	59.9	67.6	71.7	69.6	9.5	9.9	9.7
Guadeloupe	64.7	70.9	67.8	71.1	78.0	74.5	6.4	7.1	6.7
Haiti	47.1	50.0	48.5	52.7	56.1	54.4	5.6	6.1	5.9

TABLE A.32 *(continued)*

Major area, region or country	Life expectancy at birth (years) 1970-1975 Male	Female	Both sexes	1990-1995 Male	Female	Both sexes	Change (in years) 1970-1975 to 1990-1995 Male	Female	Both sexes
Jamaica	66.6	70.8	68.7	71.4	75.8	73.6	4.8	5.0	4.9
Martinique	66.3	72.0	69.2	73.0	79.5	76.3	6.7	7.5	7.1
Netherlands Antilles	67.8	73.0	70.4	72.4	78.5	75.5	4.6	5.5	5.1
Puerto Rico	69.2	76.0	72.2	71.6	79.7	75.6	2.4	3.7	3.4
Trinidad and Tobago	63.6	68.3	65.9	70.5	75.2	72.7	6.9	6.9	6.8
Central America	59.0	63.7	61.3	67.6	73.4	70.5	8.6	9.7	9.2
Belize	66.9	68.3	67.6	72.4	75.0	73.6	5.5	6.7	6.1
Costa Rica	66.1	70.2	68.1	74.0	78.7	76.3	7.9	8.4	8.2
El Salvador	56.5	61.0	58.7	64.1	71.8	67.9	7.5	10.7	9.2
Guatemala	52.6	55.5	54.0	62.4	67.3	64.8	9.8	11.9	10.8
Honduras	52.1	56.2	54.1	65.4	70.1	67.7	13.3	13.9	13.6
Mexico	60.1	65.2	62.6	68.5	74.5	71.5	8.4	9.4	8.9
Nicaragua	53.7	56.8	55.3	63.5	68.7	66.1	9.8	11.9	10.8
Panama	65.0	68.0	66.4	70.8	75.0	72.8	5.9	7.0	6.4
South America	58.3	63.3	60.7	64.4	71.4	67.8	6.2	8.2	7.1
Argentina	64.1	70.8	67.2	68.6	75.7	72.1	4.5	4.9	4.9
Bolivia	44.6	49.0	46.7	57.7	61.0	59.4	13.2	12.0	12.6
Brazil	57.6	62.2	59.8	62.3	70.1	66.0	4.7	7.9	6.2
Chile	60.5	66.8	63.6	71.5	77.4	74.5	11.1	10.6	11.0
Colombia	59.9	63.5	61.7	67.1	72.4	69.7	7.2	9.0	8.1
Ecuador	57.4	60.5	58.9	66.4	71.4	68.8	9.0	11.0	9.9
Guyana	58.0	62.1	60.0	59.8	66.4	63.0	1.8	4.3	3.0
Paraguay	63.8	68.1	66.0	66.3	70.8	68.6	2.5	2.7	2.6
Peru	53.9	57.3	55.5	64.4	69.2	66.7	10.5	11.9	11.2
Suriname	61.7	66.5	64.0	67.8	72.8	70.3	6.1	6.3	6.2
Uruguay	65.6	72.2	68.8	69.3	75.7	72.5	3.6	3.5	3.7
Venezuela	63.3	68.9	66.0	68.9	74.7	71.7	5.6	5.8	5.7
Northern America	67.7	75.4	71.5	72.8	79.5	76.2	5.1	4.1	4.7
Canada	69.7	76.8	73.2	75.6	81.4	78.5	5.9	4.6	5.3
United States of America	67.5	75.3	71.3	72.5	79.3	75.9	5.0	4.0	4.6
Oceania	64.0	69.4	66.6	70.3	75.6	72.9	6.4	6.2	6.3
Australia-New Zealand	68.4	75.1	71.7	74.5	80.3	77.4	6.0	5.2	5.7
Australia	68.4	75.2	71.7	74.7	80.6	77.6	6.3	5.4	5.9
New Zealand	68.7	74.8	71.7	73.1	78.9	76.0	4.4	4.1	4.3
Melanesia	50.5	51.2	50.8	58.1	60.3	59.1	7.6	9.1	8.3
Fiji	63.6	66.7	65.1	69.5	73.7	71.5	5.9	7.0	6.4
New Caledonia	61.5	66.5	63.9	69.7	74.7	72.1	8.2	8.2	8.2
Papua New Guinea	47.7	47.6	47.7	55.2	56.7	55.8	7.5	9.1	8.2
Solomon Islands	60.2	63.9	62.0	68.4	72.7	70.4	8.2	8.8	8.4
Vanuatu	52.4	55.7	54.0	63.5	67.3	65.2	11.0	11.7	11.2
Micronesia	57.6	61.7	59.5	65.7	69.1	67.3	8.1	7.4	7.8
Guam	65.7	73.3	69.4	72.2	76.0	74.0	6.5	2.7	4.6
Polynesia	57.8	61.0	59.3	67.2	71.6	69.3	9.4	10.5	9.9
French Polynesia	59.3	63.0	60.9	68.3	73.8	70.8	9.0	10.8	9.9
Samoa	57.0	60.0	58.5	65.9	69.2	67.5	8.9	9.2	9.1

Source: Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.XIII.5).

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

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

TABLE A.33. TRENDS IN INFANT MORTALITY, MAJOR AREAS, REGIONS AND COUNTRIES, 1970-1995

Major area, region or country	Infant mortality rate (per 1,000 births) 1970-1975	1990-1995	Annual percentage change 1970-1975 to 1990-1995
World total	93	62	-2.0
More developed regions[a]	21	11	-3.5
Less developed regions[b]	104	68	-2.1
Least developed countries	147	109	-1.5
Africa	130	94	-1.6
Eastern Africa	137	108	-1.2
Burundi	137	120	-0.7
Comoros	135	91	-1.9
Djibouti	154	115	-1.5
Eritrea	136	107	-1.2
Ethiopia	154	119	-1.3
Kenya	98	71	-1.6
Madagascar	172	93	-3.1
Malawi	191	148	-1.2
Mauritius	55	18	-5.6
Mozambique	168	118	-1.8
Réunion	41	8	-8.4
Rwanda	142	139	-0.1
Somalia	155	122	-1.2
Uganda	116	122	0.3
United Republic of Tanzania	125	86	-1.8
Zambia	100	111	0.5
Zimbabwe	93	70	-1.4
Middle Africa	135	97	-1.6
Angola	173	124	-1.6
Cameroon	119	65	-3.0
Central African Republic	132	100	-1.4
Chad	166	123	-1.5
Congo	95	89	-0.3
Democratic Republic of the Congo	127	95	-1.4
Equatorial Guinea	157	117	-1.5
Gabon	132	94	-1.7
Northern Africa	132	67	-3.4
Algeria	132	55	-4.4
Egypt	150	67	-4.0
Libyan Arab Jamahiriya	117	68	-2.7
Morocco	122	62	-3.4
Sudan	110	85	-1.3
Tunisia	120	43	-5.1
Southern Africa	81	55	-1.9
Botswana	88	55	-2.4
Lesotho	130	81	-2.4
Namibia	113	64	-2.8
South Africa	76	53	-1.8
Swaziland	133	75	-2.9
Western Africa	129	98	-1.4
Benin	137	90	-2.1
Burkina Faso	137	103	-1.4
Cape Verde	82	50	-2.5
Côte d'Ivoire	129	91	-1.8
Gambia	179	132	-1.5
Ghana	107	81	-1.4
Guinea	177	134	-1.4
Guinea-Bissau	183	141	-1.3
Liberia	182	200	0.5

TABLE A.33 *(continued)*

Major area, region or country	Infant mortality rate (per 1,000 births) 1970-1975	1990-1995	Annual percentage change 1970-1975 to 1990-1995
Liberia	182	200	0.5
Mali	203	159	-1.2
Mauritania	142	101	-1.7
Niger	167	124	-1.5
Nigeria	111	84	-1.4
Senegal	122	68	-2.9
Sierra Leone	193	195	0.1
Togo	129	91	-1.8
Asia	98	62	-2.3
Eastern Asia	56	41	-1.6
China	61	44	-1.6
Democratic People's Republic of Korea	50	24	-3.6
Hong Kong, China	17	6	-5.5
Japan	12	4	-5.0
Mongolia	98	59	-2.5
Republic of Korea	38	11	-6.3
South-central Asia	132	78	-2.6
Afghanistan	194	163	-0.9
Bangladesh	140	91	-2.2
Bhutan	178	117	-2.1
India	132	78	-2.6
Iran (Islamic Republic of)	122	43	-5.2
Kazakhstan	50	34	-1.9
Kyrgyzstan	59	39	-2.0
Maldives	121	60	-3.5
Nepal	160	96	-2.6
Pakistan	140	85	-2.5
Sri Lanka	56	18	-5.8
Tajikistan	74	56	-1.4
Turkmenistan	78	57	-1.6
Uzbekistan	63	43	-1.9
South-eastern Asia	101	54	-3.2
Brunei Darussalam	54	9	-9.0
Cambodia	181	116	-2.2
East Timor	183	149	-1.0
Indonesia	114	58	-3.4
Lao People's Democratic Republic	145	97	-2.0
Malaysia	42	13	-5.9
Myanmar	122	90	-1.5
Philippines	71	40	-2.9
Singapore	19	5	-6.2
Thailand	65	32	-3.6
Viet Nam	106	42	-4.6
Western Asia	111	60	-3.1
Armenia	22	25	0.6
Azerbaijan	41	33	-1.0
Bahrain	52	20	-4.8
Cyprus	29	9	-5.6
Georgia	35	23	-2.0
Iraq	96	127	1.4
Israel	23	9	-4.9
Jordan	82	36	-4.1
Kuwait	43	18	-4.3
Lebanon	48	34	-1.7
Oman	145	30	-7.9

TABLE A.33 *(continued)*

Major area, region or country	Infant mortality rate (per 1,000 births) 1970-1975	1990-1995	Annual percentage change 1970-1975 to 1990-1995
Qatar	57	20	-5.2
Saudi Arabia	105	29	-6.5
Syrian Arab Republic	88	39	-4.0
Turkey	138	53	-4.8
United Arab Emirates	57	19	-5.6
Yemen	184	92	-3.5
Europe	25	13	-3.3
Eastern Europe	28	19	-1.9
Belarus	21	16	-1.6
Bulgaria	26	16	-2.3
Czech Republic	20	9	-3.7
Hungary	34	14	-4.6
Poland	27	14	-3.3
Republic of Moldova	46	26	-2.8
Romania	40	24	-2.6
Russian Federation	28	22	-1.2
Slovakia	24	13	-3.2
Ukraine	22	18	-1.1
Northern Europe	16	7	-4.0
Denmark	12	8	-2.3
Estonia	21	15	-1.7
Finland	12	5	-4.0
Iceland	12	5	-4.0
Ireland	18	7	-4.9
Latvia	21	16	-1.4
Lithuania	22	15	-2.0
Norway	12	5	-4.2
Sweden	10	5	-3.2
United Kingdom	17	7	-4.5
Southern Europe	31	11	-5.1
Albania	58	32	-3.0
Bosnia and Herzegovina	51	15	-6.1
Croatia	27	11	-4.7
Greece	34	9	-6.9
Italy	26	8	-6.1
Malta	22	9	-4.4
Portugal	45	9	-8.2
Slovenia	22	7	-5.3
Spain	21	8	-5.2
The former Yugoslav Republic of Macedonia	74	27	-5.0
Yugoslavia	47	21	-4.1
Western Europe	18	7	-5.0
Austria	24	7	-6.1
Belgium	19	8	-4.4
France	16	7	-4.0
Germany	21	6	-6.1
Luxembourg	16	6	-4.6
Netherlands	12	6	-3.1
Switzerland	13	5	-4.6
Latin America and the Caribbean	80	40	-3.5
Caribbean	72	43	-2.6
Bahamas	33	16	-3.5
Barbados	33	9	-6.5
Cuba	38	10	-6.7

TABLE A.33 *(continued)*

Major area, region or country	Infant mortality rate (per 1,000 births) 1970-1975	1990-1995	Annual percentage change 1970-1975 to 1990-1995
Dominican Republic	94	42	-4.0
Guadeloupe	42	9	-7.5
Haiti	135	89	-2.1
Jamaica	42	14	-5.5
Martinique	35	9	-6.8
Netherlands Antilles	28	13	-3.9
Puerto Rico	25	11	-4.2
Trinidad and Tobago	41	16	-4.7
Central America	74	37	-3.5
Belize	52	33	-2.3
Costa Rica	53	14	-6.7
El Salvador	99	44	-4.0
Guatemala	95	48	-3.4
Honduras	104	43	-4.4
Mexico	69	34	-3.5
Nicaragua	98	52	-3.1
Panama	43	25	-2.7
South America	84	41	-3.6
Argentina	48	24	-3.4
Bolivia	151	75	-3.5
Brazil	91	47	-3.2
Chile	69	14	-7.9
Colombia	73	28	-4.8
Ecuador	95	50	-3.2
Guyana	79	63	-1.1
Paraguay	53	43	-1.0
Peru	110	55	-3.4
Suriname	49	28	-2.8
Uruguay	46	20	-4.2
Venezuela	49	23	-3.7
Northern America	18	9	-3.7
Canada	16	6	-5.0
United States of America	18	9	-3.6
Oceania	41	26	-2.2
Australia-New Zealand	17	7	-4.3
Australia	17	7	-4.6
New Zealand	16	9	-3.1
Melanesia	89	59	-2.1
Fiji	45	23	-3.3
New Caledonia	53	22	-4.5
Papua New Guinea	100	68	-1.9
Solomon Islands	61	27	-4.1
Vanuatu	99	47	-3.7
Micronesia	72	41	-2.8
Guam	21	11	-3.2
Polynesia	84	35	-4.4
French Polynesia	64	11	-8.6
Samoa	99	64	-2.2

Source : Population Division, Department of Economic and Social Affairs of the United Nations Secretariat, *World Population Prospects: The 1996 Revision* (United Nations publication, Sales No. E.98.XIII.5).

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

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

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